NASA CR-151939

WIND TUNNEL TEST ON A 1/4.622 FROUDE SCALE, HINGELESS ROTOR, TILT ROTOR MODEL

VOLUME IV

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September 1976

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for

National Aeronautics and Space Administration
Ames Research Center

by

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ABSTRACT

This document is Volume IV of four volumes of experimental data obtained on a wind tunnel test of a 1/4.62 Froude scale hingeless rotor tilt rotor model. The test generated parametric data from hover, through transition and out to 300 knots full scale speed in cruise, and was performed under NASA Contract NAS2-9015.

This volume contains cruise flight data files.

FOREWORD

This report was prepared by the Boeing Vertol Company of Philadelphia, Pennsylvania for the National Aeronautics and Space Administration, Ames Research Center under NASA Contract NAS2-9015.

Mr. M. A. Shovlin and Mr. T. Galloway of Ames Research Center were technical monitors for this work.

The Boeing Program Manager was Mr. J. P. Magee. The contributions of the Boeing Vertol Wind Tunnel staff are acknowledged.

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LIST OF TABLES

LIST OF SYMBOLS

SYMBOL	NOMENCLATURE	UNITS
A_1	Lateral cyclic pitch	Deg
B_1	Longitudinal cyclic pitch	Deg
b	Span	Ft
CTB-L	Left Rotor Thrust Coefficient	$\frac{T_L}{\rho \pi R^2 V_T^2}$
CPB-L	Left Rotor Power Coefficient	$\frac{HP_L \times 550}{\rho \pi R^2 V_T^3}$
CNFB-L	Left Rotor Normal Force Coefficient	$\frac{NF_L}{\rho \pi R^2 V_T^2}$
CSFB-L	Left Rotor Side Force Coefficient	$\frac{SF_L}{\rho \pi R^2 V_T^2}$
CPMB-L	Left Rotor Pitching Moment	$\frac{PM_L}{\rho \pi R^3 V_T^2}$
CYMB-L	Left Rotor Yawing Moment	$\frac{YM_L}{\rho \pi R^3 V_T^2}$
CTB-R	Right Rotor Thrust Coefficient	$\frac{T_R}{\rho \pi R^2 V_T^2}$
CPB-R	Right Rotor Power Coefficient	$\frac{HP_L \times 550}{\rho \pi R^2 V_T^3}$
CNFB-R	Right Rotor Normal Force Coefficient	$\frac{NF_R}{\rho \pi R^2 V_T^2}$
CSFB-R	Right Rotor Side Force Coefficient	$\frac{SF_R}{\rho \pi R^2 V_T^2}$
CPMB-R	Right Rotor Pitching Moment	$\frac{PM_R}{\rho \pi R^3 V_T^2}$

LIST OF SYMBOLS (continued)

SYMBOL	NOMENCLATURE	UNITS
CYMB-R	Right Rotor Yawing Moment	$\frac{YM_R}{\rho\pi R^3 V_T^2}$
CLW-AC	Aircraft Lift Coefficient	$\frac{Lift}{1/2\rho V^2 S}$
CSFW-AC	Aircraft Side Force Coefficient	$\frac{SF}{1/2\rho V^2 S}$
CAFN-AC	Aircraft Axial Force Coefficient	$\frac{Axial\ Force}{1/2\rho V^2 S}$
CPMW-AC	Aircraft Pitching Moment	$\frac{Pitch\ Moment}{1/2\rho V^2 S\bar{c}}$
CYMW-AC	Aircraft Yawing Moment	$\frac{Yaw\ Moment}{1/2\rho V^2 Sb}$
CRMW-AC	Aircraft Rolling Moment	$\frac{Roll\ Moment}{1/2\rho V^2 Sb}$
$\bar{c}$	Wing Chord	FT
D	Diameter	-
D'	Airframe Drag	LB
EI_{FLAP}	Flapwise Bending Stiffness	-
EI_{CHORD}	Chordwise Bending Stiffness	-
FM	Figure of Merit	-
GJ	Torsional Stiffness	-
GW	Gross Weight	LB
HP	Rotor Horsepower	HP
I_{xx}, I_{yy}, I_{zz}	Mass Moment of Inertia about the Three Axes	IN-LB SEC^2
I_N	Nacelle Incidence	Deg
I_P	Acceleration Pitch Inertia	-
H_Z	Hertz	-

LIST OF SYMBOLS (continued)

SYMBOLS	NOMENCLATURE	UNITS
I^*_p	Centrifugal Pitch Inertia	-
I_{PIVOT}	Moment of Inertia - Polar	LB-FT
i_w	Wing Incidence	Deg
L	Lift	LB
NA	Neutral Axis	-
p	Per Rotor Revolution	-
PM	Pitching Moment	FT LB
q	Freestream Dynamic Pressure $1/2\rho V^2$	LB/FT^2
R	Rotor Radius	FT
r	Radial Location to a Blade Station	FT
RM	Rolling Moment	FT LB
S	Wing Area	FT^2
SF	Side Force	LB
T	Rotor Thrust	LB
t	Airfoil Thickness	FT
V	Freestream Velocity	FT/SEC
V_T	Rotor Tip Speed	FT/SEC
X	Aircraft Propulsive Force	LB
X/R or r/R	Non-Dimensional Radius	-
YM	Yawing Moment	FT LB
α	Angle of Attack	-
α_f	Fuselage Pitch Deflection	Deg
α_s	Nacelle Shaft Pitch Deflection	Deg

LIST OF SYMBOLS (continued)

SYMBOLS	NOMENCLATURE	UNITS
β	Side Slip Angle	Deg
δ_A	Aileron Deflection	Deg
δ_F	Flap Deflection	Deg
∂	Partial Derivative Operator	-
Δ	Increment In Coefficient	-
$\Delta\theta$	Incremental Blade Pitch	-
ρ	Density of Air	LB SEC^2/FT^4
σ	Rotor Solidity $\frac{bcR}{\pi R^2}$	-
ψ	Rotor Azimuth Angle	Deg
θ_{75}	Rotor Blade Collective Pitch at the Three Quarter Radius	Deg
μ	Advance Ratio V/V_T	-
ω_α	Wing Torsional Frequency	cps
ω_β	2nd Mode Bending Blade Frequency	-
ω_C	Wing Chordwise Bending Frequency	cps
ω_L	1st Mode Bending Blade Frequency	-
ω_P	Aircraft Pitch Frequency	cps
ω_V	Wing Vertical Bending Frequency	cps
Ω	Rotor Angular Velocity	-
$1\Omega, 2\Omega$	Integer Frequency Ratio	-
$\Omega-\omega\ell$	Lower Blade Lag Rotational Frequency	cps
$\Omega+\omega\beta$	Upper Blade Flap Rotational Frequency	cps
$\Omega-\omega\beta$	Lower Blade Flap Rotational Frequency	cps

LIST OF SYMBOLS (continued)

SYMBOLS	NOMENCLATURE	UNITS
ζ_V	Wing Vertical Bending Damping % Critical	-
ζ_C	Wing Chord Bending Damping % Critical	-
ζ_α	Wing Torsion Damping % Critical	-

1.0 INTRODUCTION

This document contains wind tunnel test data obtained on a 1/4.622 scale dynamically similar model of a tilt rotor aircraft which has composite hingeless blades. The test was performed under NASA contract NAS2-9015.

The objective of the test was to generate information on the behavior of rotor and airframe effects over a range of flight parameters representing the complete operating envelope of the tilt rotor vehicle. The information which was required included the magnitude and sensitivity of:

(1) Rotor forces and moments

(2) Blade loads and pitch link loads

(3) Wing rotor interference effects

(4) Airframe forces and moment

for values of such flight parameters as:

(1) Nacelle tilt angle

(2) Forward speed

(3) Aircraft attitude in pitch and yaw

(4) Collective and cyclic pitch control

(5) Wing flap deflection

The selection of test points and true variations for parameters was made in such a way that a comprehensive set of data was obtained for all potential flight conditions through hover, a wide envelope of transitions, and cruise at speeds up to 300 knots.

The purpose of this acquisition of comprehensive rotor and airframe test data is to provide the knowledge and basis for understanding rotor and airframe behavior which is an essential prerequisite to the development of an efficient system of integrated rotor and aircraft controls.

A secondary objective of the test was to determine the feasibility of a control system which minimizes blade loads in cruise. The characteristic feature of this system is the use of cyclic pitch geared by a simple mechanical linkage to the motion of the stick and control surfaces. These must be properly phased and scheduled to achieve good flying qualities in all flight regimes, subject to the overall design requirement of an optimal control system to maintain simplicity and reliability as far as is consistent with the loads, maneuver envelope and flying qualities of the aircraft.

The rotor controls provide a major portion of the control capability from hover through the low transition speed range, although the conventional control surfaces are operative in all regimes of flight including hover. As speed is increased, and the aerodynamic surfaces become effective for trim and control, the rotor controls can be directed at minimizing rotor loads. In cruise the problem reduces to determining the rotor control required to maintain minimum loads. Prior to this test, a limited amount of full scale experimental data existed for transition, and for cruise up to speeds of 192

knots. This test program extends the range of this data in the transition regime, and in cruise flight the range was extended up to the simulated speed of 300 knots.

The data obtained on this test goes a long way toward providing the information which is necessary to tackle the job of designing an optimized and integrated control system for a tilt rotor aircraft using a soft inplane hingeless rotor. Work which remains to be done involves reducing the data obtained in the test, to an analytical format with forces, moments, loads, etc., expressed as functions of the relevant flight parameters. This is necessary for two reasons:

(1) to provide an understanding of the significance and relative importance of the parameters which will permit efficient planning of future full scale tests

(2) to provide a set of simple functions representing the body of test data, from which the rotor effects may be calculated within the context of a real time simulation

This reduction of the test data to analytical functions of the parameters is beyond the scope of the current contract. It is planned that this additional step will be accomplished in the near future under separate funding.

The data obtained during this test is presented in four volumes.

Volume I contains a detailed description of the model, the test installation, test procedures and data reduction: for the convenience of the user, an abbreviated discussion of these is included in Volumes II, III and IV. It was felt that the amount of data generated was too voluminous to be readily presented in a single volume, and Volumes II, III and IV present all the data in a logical sequence.

2.0 DESCRIPTION OF MODEL AND DATA FILE SYSTEM

This section of the report contains an abbreviated description of the model and also an explanation of the order in which the data are presented and identifies the values of test variables held constant in any given test run.

2.1 Model Description

The model tested is a 1/4.622 scale full span, powered configuration that is Froude scaled from the Model 222 Tilt Rotor Research aircraft. This model, shown in Figure 1 was provided by the contractor for this test program and has the following major dynamically-scaled components.

1. Two 3-bladed rotors
2. Two nacelles
3. Full span wing
4. Fuselage
5. Tail

Basic model dimensions are shown in Table 1. The rotors are defined in Figure 2 and have the same aerodynamic and aeroelastic characteristics as the full scale rotor built under NASA contract NAS2-6505. It has remote controlled collective pitch and two axes cyclic pitch actuation systems.

The nacelles are joined to the wing by a pivot and have remote pitch actuation.

TABLE 1

MODEL DIMENSIONS

ROTOR

Number of Blades	3
Radius	33.75 IN. (85.72 cm)
Chord	4.078 IN. (10.35 cm)
Twist	42.5 DEG.
Airfoil Section	23021/23010-1.58
Solidity	0.115
Rotor Speed (Hover)	1185 RPM
Rotor Speed (Cruise)	825 RPM
Collective Pitch Available	-5 to 65 DEG.
Cyclic Pitch Available	± 10 DEG.

NACELLE

Nacelle Pivot Position (in % of Wing Chord)	40%
Rotor Disc Nacelle Pivot Distance	12.33 IN. (31.31 cm)

WING

Airfoil Section	63_4221 Modified
Span (Rotor ℄ to Rotor ℄)	86.76 IN. (220.37 cm)
chord	15.53 IN. (39.44 cm)
Area	9.36 FT.^{2} (.869 M^2)
Aspect Ratio	5.61
Flap in % of Chord	30%
Wing Incidence	2 DEG.
Thickness - Chord Ratio	0.21

FUSELAGE

Diameter	14.69 IN. (37.31 cm)
Length	102.50 IN. (260.35 cm)

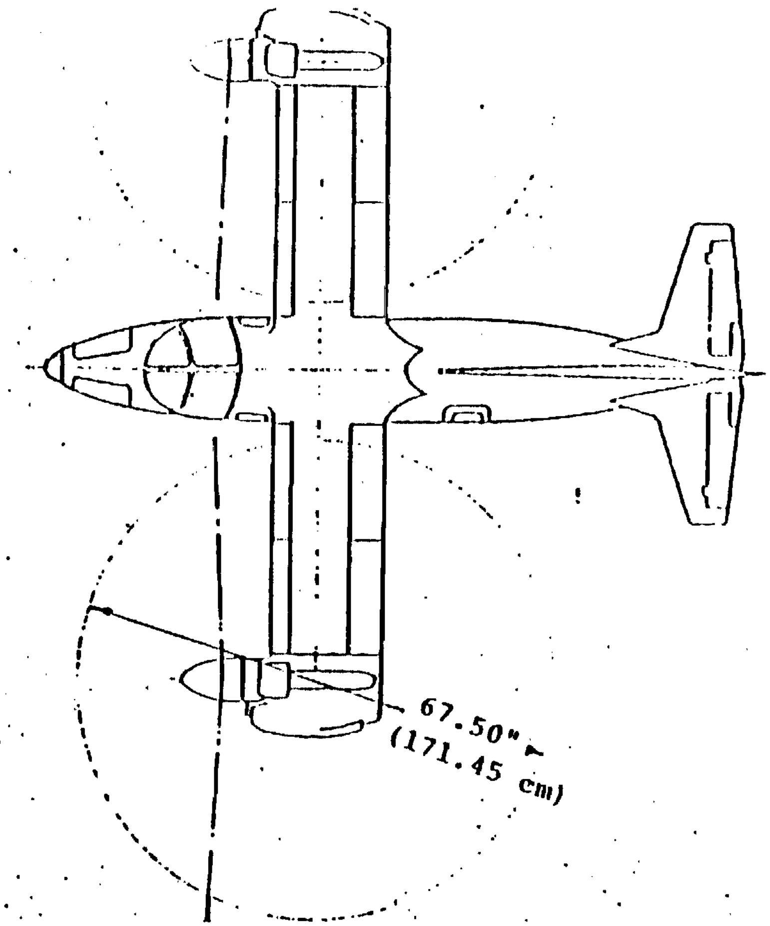
TAIL - HORIZONTAL

Area	2.73 FT.^{2} (.253 M^2)
Span	10.89 IN. (27.66 cm)
Aspect Ratio	4.25
Taper Ratio (C_{TIP}/C_{ROOT})	.384
Root Chord	14.05 IN. (35.68 cm)
Airfoil Section	64A010
Elevators in % of Chord	44.1%

TABLE 1 (continued)

TAIL - VERTICAL

Area	2.03 FT^2	(.185 M^2)
Span	22.75 IN.	(57.78 cm)
Aspect Ratio	1.77	
Taper Ratio (C_{TIP}/C_{ROOT})	.35	
Root Chord	20.98 IN.	(58.29 cm)
Airfoil Section	64A008	
Rudder in % of Chord	50.6	

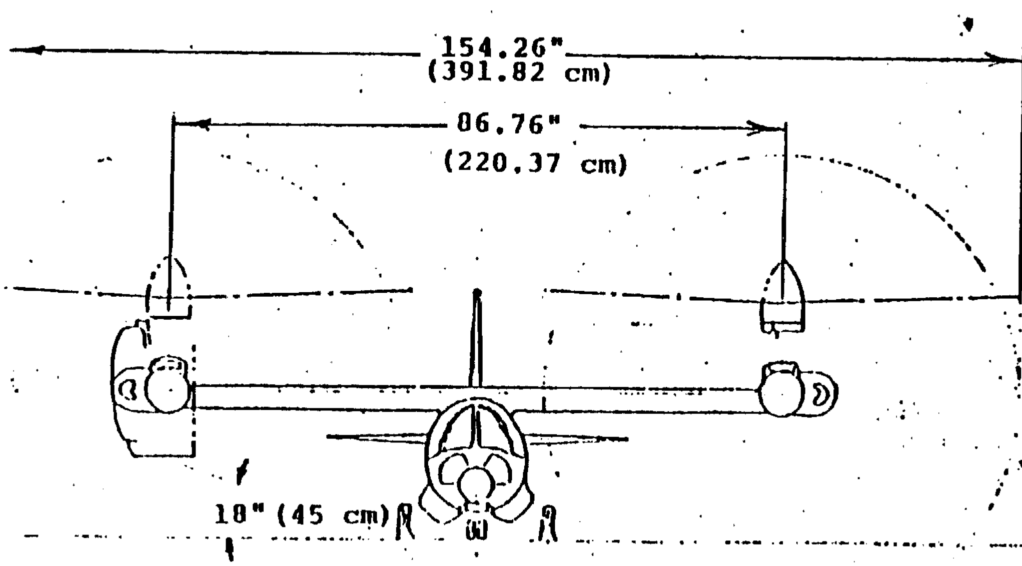


ROTOR

Diameter	67.50 In.	(171.45 cm)
Solidity	.115	
No. Blades	3	

WEIGHTS

Design Gross Wt	122 Lbs	(55.35 Kg)



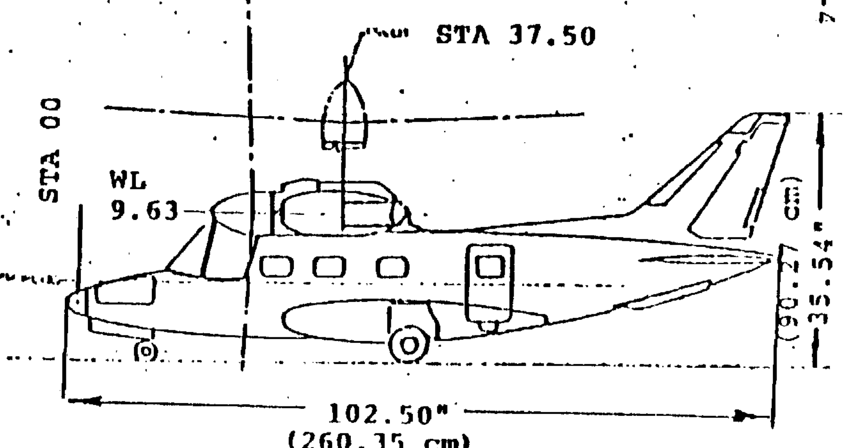


FIGURE 1 1/4.622 FROUDE SCALE WIND TUNNEL MODEL.

85.72

ROTOR RADIUS = 33.75
3 BLADES/ROTOR

TWIST REFERS TO
BOEING REFERENCE LI

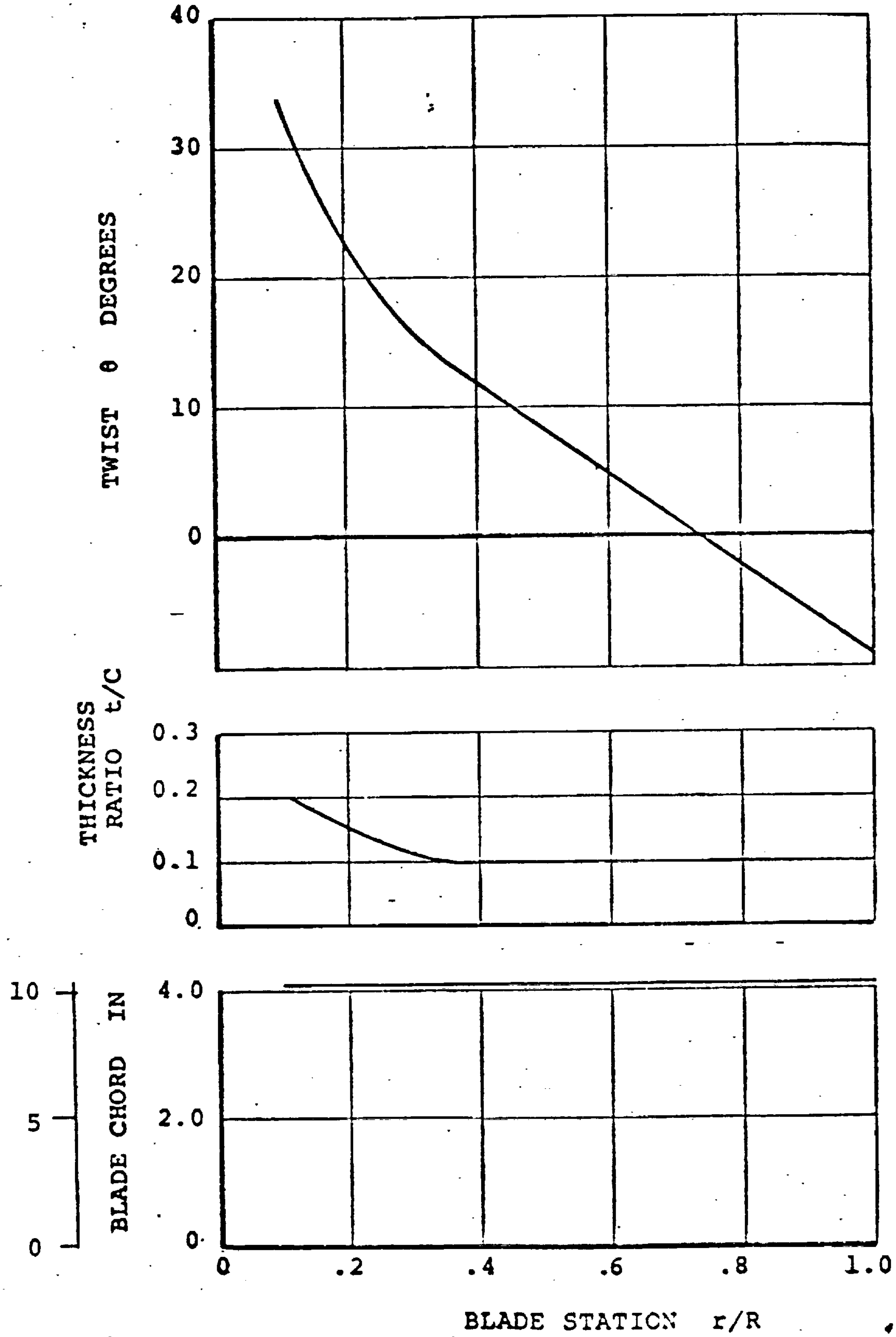


FIGURE 2. 1/4.622 FROUDE SCALE MODEL BLADE DEFINITION

The wing is crown mounted and has full span flaps and leading edge umbrellas for download alleviation. Flaps are used during transition to provide additional lift and the outboard section of the flap is used as an aileron for control in conjunction with outboard spoilers.

The wing, fuselage, and empennage are dynamically scaled from the Model 222 aircraft and the rudder and elevator are remotely controlled. The model was supported on a pedestal mount with pitch and yaw capability.

The primary instrumentation includes strain gages to obtain flap, chord and torsion loads at the blade root. A six component balance in each nacelle measures the rotor forces moments and torque. A six component main balance located in the fuselage measures aircraft forces and moments. Position indicators connected to meters provide a visual display of the aircraft control positions which were remotely controlled. Each rotor has an RPM and 1/rev output. Thermocouple readouts provided safety monitoring of critical motor, gearbox and cross shaft bearing temperatures.

The model is powered by a 20 HP, 11,375 RPM electric motor manufactured by Task Corporation. The motor drives a 3.04:1 reduction gear box in the center fuselage which is connected by cross shafts in the wing to a 3.09:1 reduction gear box in each nacelle. This provides a total gear reduction from the electric motor to rotor of 9.39:1.

Photographs of the model and detailed model data are provided in Volume I

Figure 3 shows the model mounting on the SRH teststand which provides pitch and yaw motion to the model. The dimensions associated with the balance centers (both main and nacelle balances) in relation to the hub center and aircraft CG reference location are shown in Figure 4.

The rotor cyclic controls are not located in the classical axis system. Figure 5 shows the location of the actuators in the azimuth and the blade location when the pitch arm is over the actuator. This defines the cyclic axis system used on test.

Sign conventions used for defining the measured forces and moments are depicted in Figure 6. The directions shown being positive forces and moments.

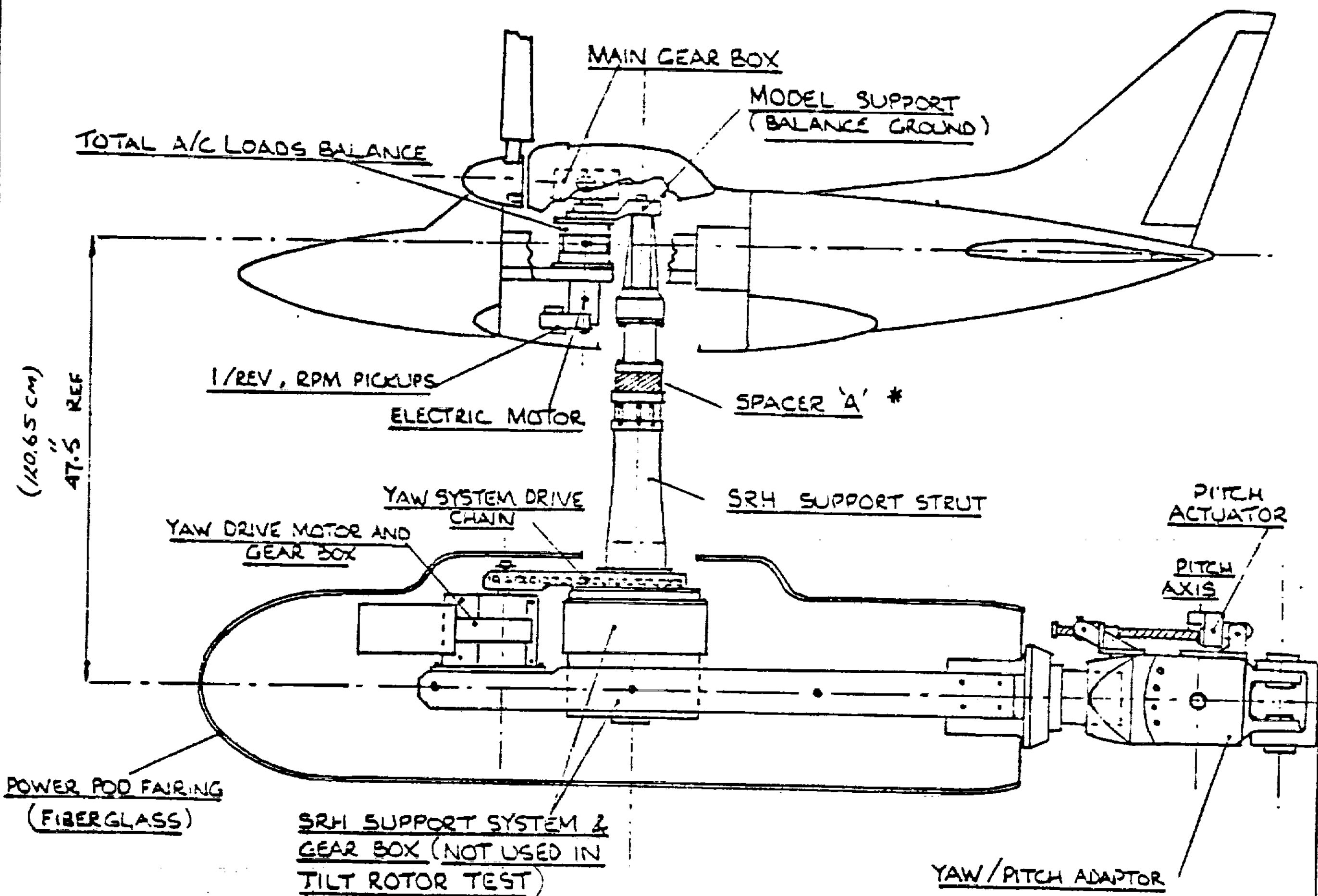
Positive pitch and yaw directions are in the same sense as positive pitch and yaw moments.

In order to provide a ready transformation of model data to full scale, a table of scale factors is given in Table 2.

2.2 Data File Index System

The procedure adopted on test is best explained by referring to Figure 7. This figure depicts the combinations of nacelle incidence I_N and airspeed (shown full scale) selected for

* FOR RUNS 1-26 SPACER 'A' WAS 20" LONG ('DUMMY' SRH BALANCE).
FOR RUNS 27-35 SPACER REPLACED BY SRH BALANCE (20" LONG).
FOR RUNS 36-166 SPACER 'A' FITTED AS DRAWN (2" LONG).



SCALE : 1/20

VR 095Q-1 ~ 1/4.622 SCALE TILT ROTOR MODEL

Figure 3. GENERAL ARRANGEMENT AND INSTALLATION ON SRH TEST STAND

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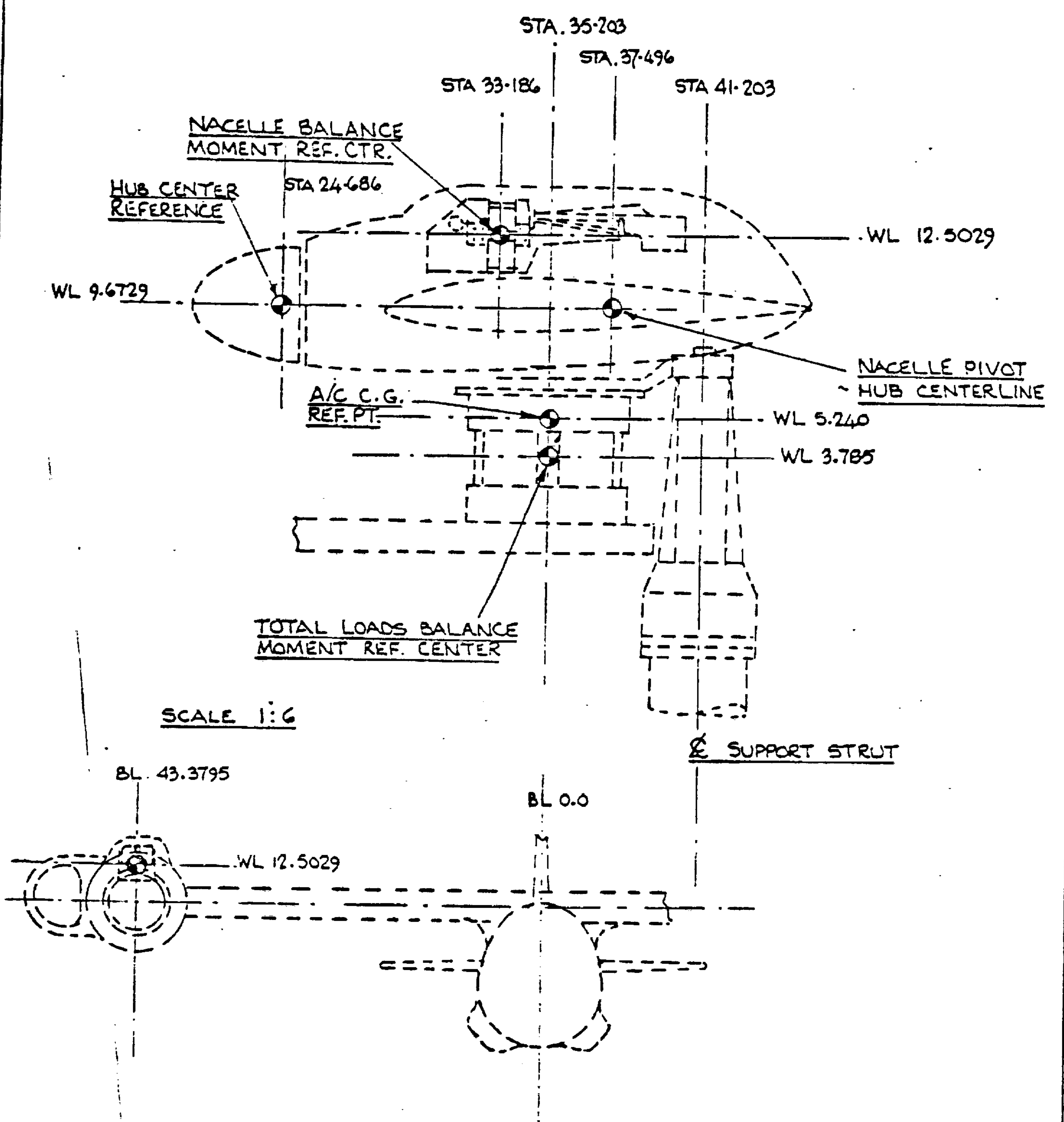
6-1-76

FORM 46284 (12/56)

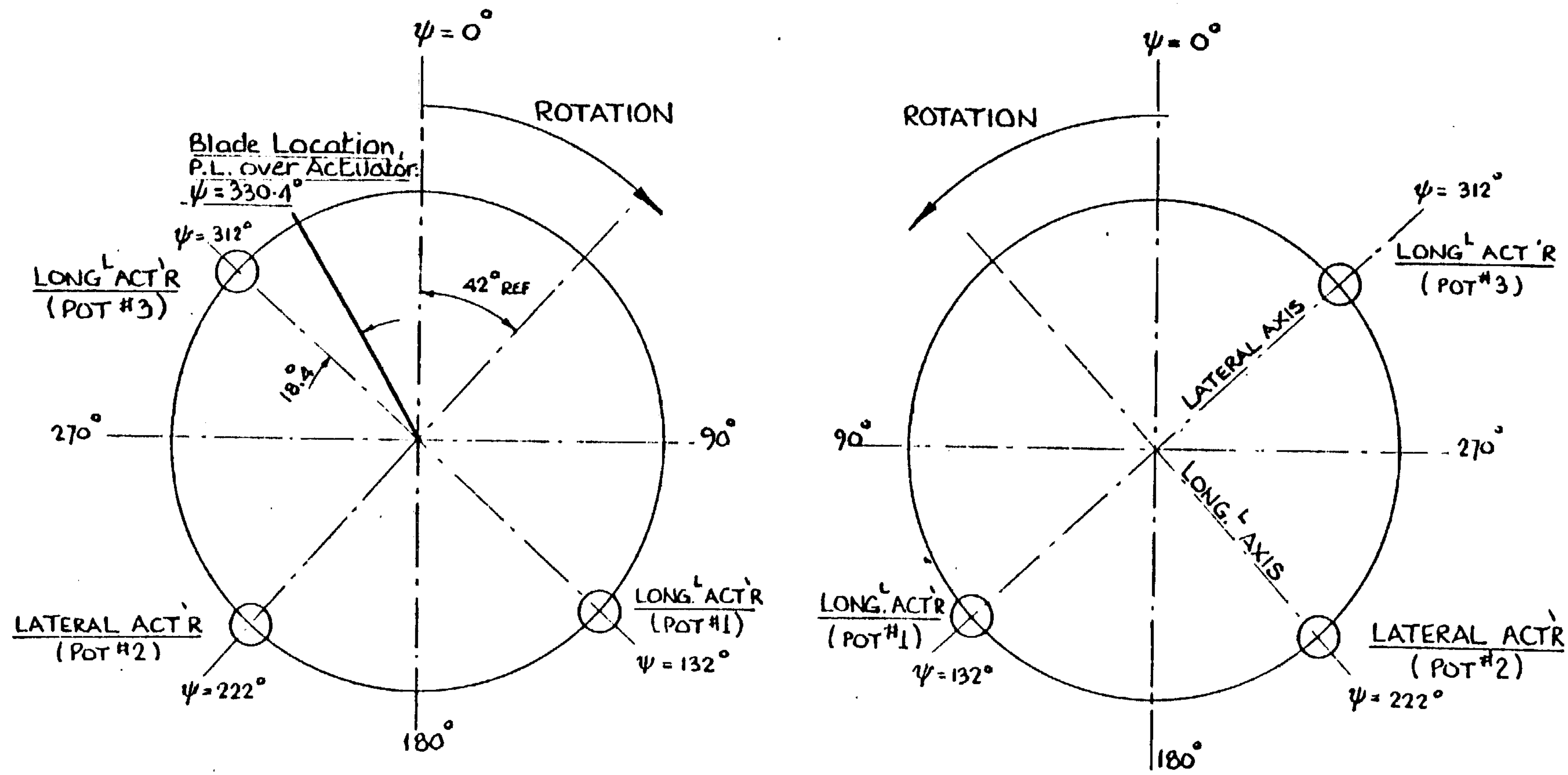


VR 095 Q-1 1/4.622 SCALE TILT ROTOR MODEL

Figure 4. RELATIVE BALANCE LOCATIONS & MODEL REFERENCES

KEF 6/2/76

FORM 46284 (2/66)



RIGHT ROTOR

LEFT ROTOR

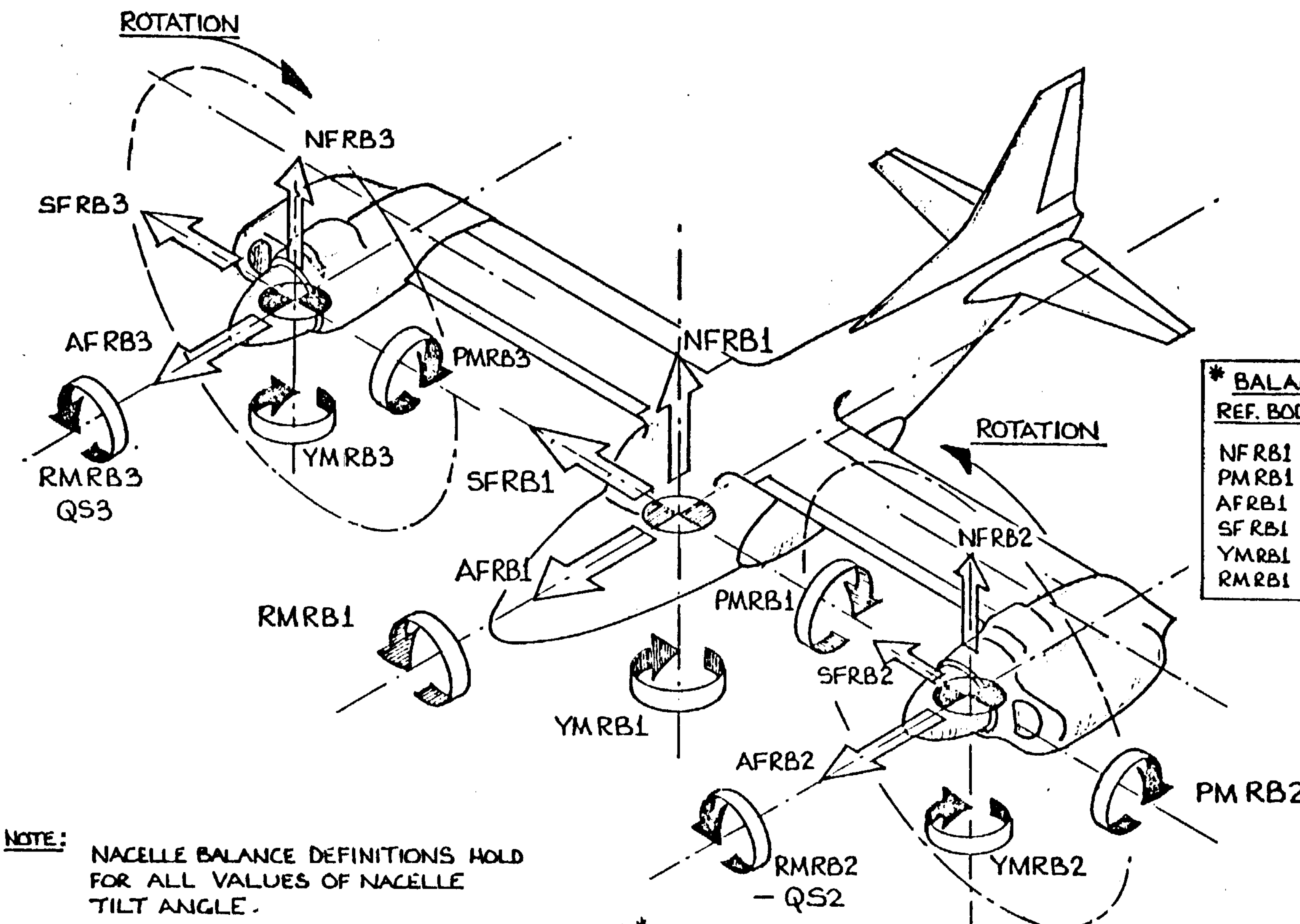
FRONT VIEW ON MODEL, $i_N = 0°$

VR 095 Q-1 1/4.622 SCALE TILT ROTOR MODEL

Figure 5. CONTROL SYSTEM ARRANGEMENT

KEF 6-7-76

FORM 46284 (2/66)



* BALANCE 1 DATA	
REF. BODY	BALANCE
NFRB1	+ AFBAL1
PMRB1	+ PMBAL1
AFRB1	− NFBAL1
SFRB1	+ SFBAL1
YMRB1	− RMBAL1
RMRB1	+ YMBAL1

NOTE: NACELLE BALANCE DEFINITIONS HOLD FOR ALL VALUES OF NACELLE TILT ANGLE.

BALANCE NO. 1 DATA HAS BEEN ROTATED 90°.*

VR 095 Q-1 1/4.622 SCALE TILT ROTOR MODEL

Figure 6. DEFINITION OF MODEL FORCES & MOMENTS REFERRED TO REF. BODY AXES

Ker
6-4-76

FORM 46284 (2/56)

TABLE 2. SCALE FACTORS

LINEAR DIMENSIONS	4.622
MASS OR WEIGHT	98.739
TIME	2.15
FREQUENCY	0.46514
VELOCITY	2.15
VISCOUS DAMPING	45.927
STIFFNESS	2109.36
SPRING RATE	21.363
MASS MOMENT OF INERTIA	2109.36
FORCE	98.739
STRAIN	1.0
MOMENT OR TORQUE	456.373
POWER	212:278
PER REV FREQUENCY	1.0
DISC LOADING	4.622
MACH NO.	2.1498
FROUDE NO.	1.0
LOCK NO.	1.0

INITIAL TEST CONDITIONS

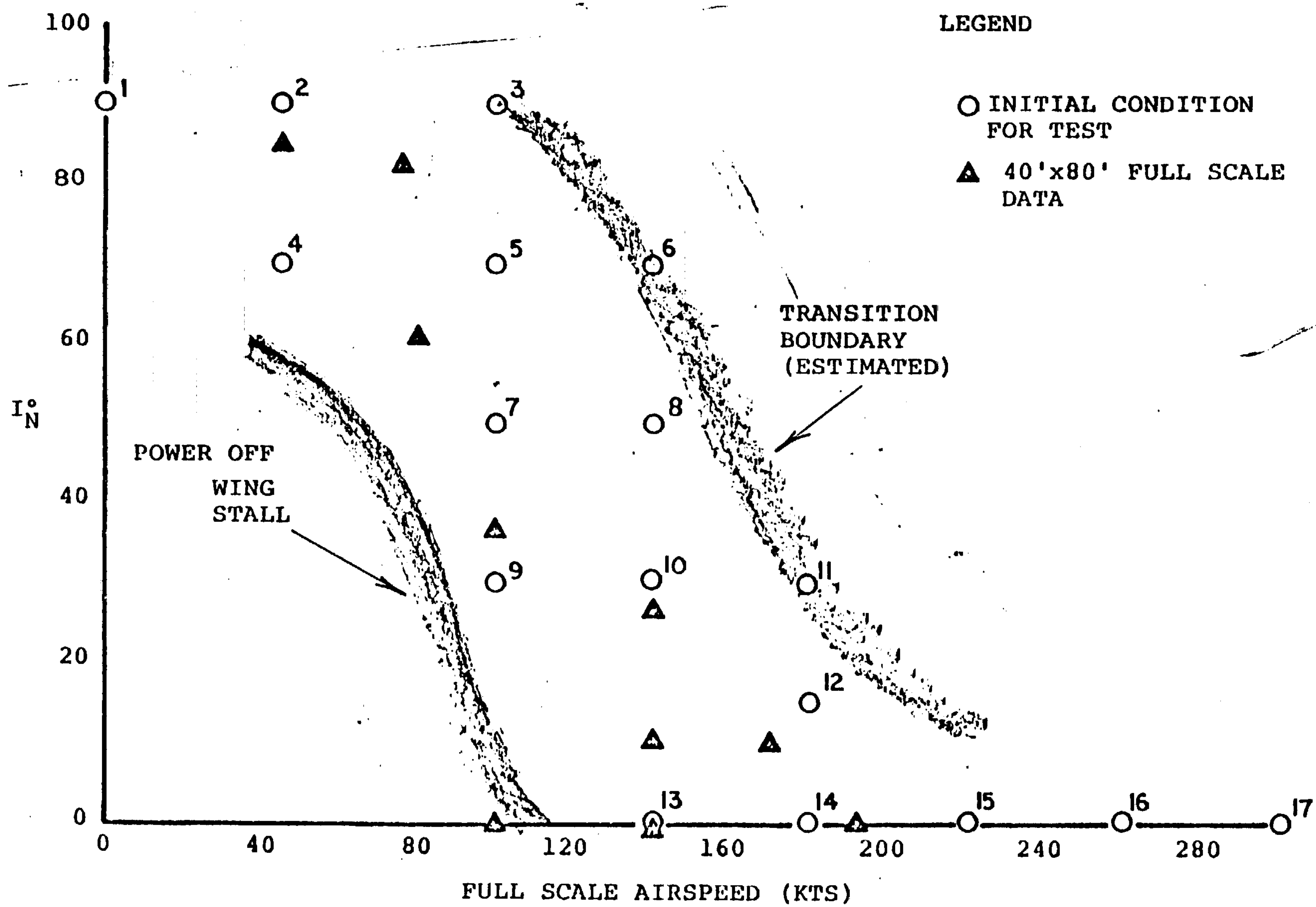


Figure 7. Scope of Test; Initial Test Conditions

initial test conditions. Seventeen initial test conditions are shown and numbered. Data obtained at conditions 1 through 4 is to be found in Volume I. This report contains cruise test data from conditions 13, 14, 15, 16 and 17 which are $I_N = -1°$ at full scale airspeeds of 140, 180, 220, 260 and 300 knots.

The hover and transition data (conditions 1 through 12) are to be found in Volumes I, II and III.

At each cruise test condition the model was set initially to zero degrees angle of attack and the following variables exercised in turn, angle of attack, with various flap settings, yaw angle, longitudinal cyclic pitch, and lateral cyclic pitch. These tests were then followed by combined angle of attack and cyclic pitch runs for load control investigations. Each data file corresponding to an initial flight condition contains the six components of force and moment (and power) on the left rotor, the right rotor and also the total airframe forces and moments. This data is followed by alternating chord bending, flap bending and pitch link loads on the left and right rotor respectively. The test variables are first plotted versus α then yaw, etc., as depicted in Table 3. For the combined angle of attack and cyclic runs only the blade load and control position data has been reduced. Each appendix number corresponds to a flight condition. For example appendix 13 corresponds to flight condition 13 which is $I_N = -1°$ at a speed which is representative of full scale 140 knots. Thus Figures 13-001 through 13-024 are the measured data as functions of α. Figures 13-025 through 13-048 are the measured

CRUISE DATA ORGANIZATION

LEFT ROTOR
- C_T
- C_P
- C_{NF}
- C_{SF}
- C_{PM}
- C_{YM}

RIGHT ROTOR
- C_T
- C_P
- C_{NF}
- C_{SF}
- C_{PM}
- C_{YM}

TOTAL AIRCRAFT
- C_L
- C_{SF}
- C_{AX}
- C_{PM}
- C_{YM}
- C_{RM}

ALT CHORD BENDING LEFT

ALT FLAP BENDING LEFT

ALT PITCH LINK LOAD LEFT

ALT CHORD BEND RT

ALT FLAP BEND RT

ALT PITCH LINK LOAD RT

VS

α^{o} (VARIOUS δ_F)

YAW^{o}

A_I^{o}

B_I^{o}

BLADE LOAD ON CYCLIC PITCH DATA VS COMBINED α , & CYCLIC

TABLE 3. TEST VARIABLE PLOTTING SEQUENCE

data as functions of yaw angle and so on. This organization and sequencing of test information is only changed when measured data were found to be spurious for reasons of instrumentation failure, etc. as noted in the instrumentation log given in Volume I.

Section 3 of this report contains notes pertaining to the data sets shown in this document and provides an account of the cases where data was found to be in error and discarded and also those cases where although no proof of error is apparent the information should be treated with caution. Fortunately, these cases amount to a small fraction of the overall results.

One further notation is necessary before the data provided can be usefully interpreted. During a run where one test variable is being exercised it is necessary to know the constant values of the other test variables. These data are identified in Table 4 for test conditions 13 through 17 are referenced by data set number, figure number and test variable name all of which are also given on the corresponding data graphs in the appendix. Thus for data set 13 the test constants during the angle of attack sweep on Runs 159, 160 and 161 (Data figures 13-001 to 13-024) can be obtained from Table 4 as

V Full Scale (Kts)	140 Kts.
αfuse	Variable

TEST VARIABLES HELD CONSTANT

CONDITION	PARAMETER VARIED	FIGURES	V	α_{FUSE}	I_N	RPM	θ_{75_L}	A_{1_L}	B_{1_L}	δ_{F_L}	θ_{75_R}	A_{1_R}	B_{1_R}	δ_{F_r}	β	DATA SET
CRUISE $I_N = -1°$ $V_{FS} = 140$ KTS	α	1-24	140		-1.4	830	33.8	-.18	-.7	0	34.6	0	0	0	0	13
	α		140		-1.4	830	33.8	-.18	-.7	10.0	34.6	0	0	10.0	0	
	α		140		-1.4	830	33.8	-.18	-.7	20.0	34.6	0	0	20.0	0	
	YAW ANGLE	25-48	139	0	-1.5	829	34.1	-.2	-.5	0	34.8	-.1	.1	0		
	LONG. CYC.	49-72	137	0	-1.3	829	33.7	-.2		0	34.1	-.1		0	0	
	LAT. CYC.	73-96	139	0	-1.4	829	33.9		-.4	0	35.2		0	0	0	
	α	97,98,100,101	139		-1.4	830	33.8	-.18	-.7	-6.8	34.6	0	0	-.1	0	
	α	97-102	137		-1.1	830	33.7			0	34.3			0	0	
CRUISE $I_N = -1°$ $V_{FS} = 180$ KTS	α	1-24	180		-1.4	830	41.4	-.3	-1.0	-.1	42.2	-.3	-.2	0	.3	14
	α		180		-1.4	829	41.4	-.3	-1.0	9.8	42.3	-.4	-.1	9.6	.3	
	α		180		-1.4	830	41.4	-.3	-1.0	19.9	42.3	-.4	-.1	19.9	.3	
	YAW ANGLE	25-48	180	0	-1.4	830	41.4	-.3	-1.0	.2	42.3	-.5	-.2	0		
	LONG. CYC.	49-72	180	0	-1.4	830	41.5	-.5		.2	42.5	-.6		0	.2	
	LAT. CYC.	73-87	180	0	-1.4	830	41.9		-1.0	.2	42.6		-.7	0	.2	
	α	88,89,91,92	180		-1.4	830	41.4	-.3	-1.0	-.1	42.2	-.3	-.2	0	.3	
	α	88-93	180		-1.4	828	41.5			.2	42.5			.1	.2	
CRUISE $I_N = -1.5°$ $V_{FS} = 220$ KTS	α	1-24	220		-1.5	830	47.1	.1	-.8	.2	48.1	-.3	-.1	.5	.2	15
	α		220		-1.5	830	47.1	.1	-.8	4.0	48.1	-.3	-.1	5.0	.2	
	α		220		-1.5	830	47.1	.1	-.8	9.7	48.1	-.3	-.1	9.7	.2	
	YAW ANGLE	25-48	220	0	-1.5	829	47.1	.1	-.8	0	48.1	-.3	-.1	0		
	LONG. CYC.	49-72	219	0	-1.4	829	46.9	.1		0	47.5	-.3		0	0	
	LAT. CYC.	73-96	219	0	-1.4	828	47.0		-.6	0	48.1		-.1	0	0	
	α	97,98,100,101	220		-1.5	830	47.1	.1	-.8	.2	48.1	-.3	-.1	.5	.2	
	α	97-102	219		-1.4	826	47.3			.7	48.1			.2	.1	

TEST VARIABLES HELD CONSTANT

CONDITION	PARAMETER VARIED	FIGURES	V	α_{FUSE}	I_N	RPM	θ_{75_L}	A_{1_L}	B_{1_L}	δ_{F_L}	θ_{75_R}	A_{1_R}	B_{1_R}	δ_{F_r}	β	DATA SET
CRUISE	α	1-24	259		-1.4	827	52.1	.2	-.1	.5	53.2	0	-.3	.3	.1	16 →
I_N = -1°	α		259		-1.4	827	52.1	.2	-.1	4.9	53.2	0	-.3	5.2	.1	
V_{FS} = 260 KTS	YAW ANGLE	25-48	259	0	-1.5	828	51.9	-.5	-.9	-.1	53.2	0	-.3	-.1		
	LONG. CYC.	49-72	259	0	-1.5	829	51.7	.3		-.4	53.3	0		-.1	.1	
	LAT. CYC.	73-96	259	0	-1.5	831	51.6		-1.0	-.1	53.2		-.4	-.1	.1	
	α	97,98,100,101	259		-1.4	827	52.1	.2	-.1	.5	53.2	0	-.4	-.1	.1	
	α	97-102	259		-1.3	830	51.8			-.1	53.4			-.1	.1	
CRUISE	α	1-24	299		-1.5	827	56.2	.3	-.75	-1.5	57.9	.35	-.27	-.1	.1	17 →
I_N = -1°	YAW ANGLE	25-48	299	0	-1.4	827	56.4	0	-.8	-1.5	57.9	.35	-.27	-.1		
V_{FS} = 300 KTS	LONG. CYC.	49-63	299	0	-1.4	825	56.3	.2		-1.5	57.9	.35		-.1	0	
	LAT. CYC.	64-87	299	0	-1.4	825	56.0		-.8	-1.5	57.7		-.27	-.1	0	
	α	88,89,91,92	299		-1.5	827	56.2	.3	-.75	-.15	57.9	.35	-.27	-.1	.1	
	α	88-93	299		-1.5	827	56.0			-.15	57.7			-.1	.1	

I_N	1.4°
RPM	527
$\theta_{.75}$ left	52.1°
A_1 left	.2°
B_1 left	-.1°
δ_F left	.5°
$\Theta_{.75}$ right	53.2°
A_1 right	0°
B_1 right	-.3°
δ_F right	-.3°
Yaw angle β	.1°

3.0 DATA DESCRIPTION

The purpose of this section of the report is to identify those test conditions and instrumentation problems which reflect on the interpretation of the data files in this volume. A complete test and instrumentation log is provided in Volume I.

The cruise data given in the appendix files of this volume was obtained on test runs 126 to 166.

The right hand rotor side force channel was found to be saturating on Run 82. The problem was internal to the balance and could not be fixed on line. To retrieve the right hand rotor data the left balance side force signal was fed into the right hand side force channel with an inverted sign. This procedure should provide reasonable data for symmetric flight conditions; however, the right hand rotor balance data should be used with caution.

During cruise runs at 140 knots and 180 knots the blade gage wave forms were observed to contain unexpected harmonics and subharmonics. Similar data was apparent in the shaft torque. During investigations to determine the cause of the problem, a flexible coupling in the drive system failed.

After replacing the coupling, the blade gage wave forms returned to normal and the test proceeded. The data at 140

knots was re-run at the end of the test; however, there was insufficient time to re-run the 180 knot data. The loads sensitivities to the test variables for condition 14 are probably correct; however, the minimum loads levels are incorrect.

At some flight speeds, angle of attack sweeps were performed with different wing flap settings to provide data on the effect of wing C_L on rotor forces and moments. This data should be analyzed point for point referring to the coincident C_L measurement since the precise flap setting might be suspect at the higher speeds.

$I_N = -1^{o}$ $V_{FS} = 140$ KTS.

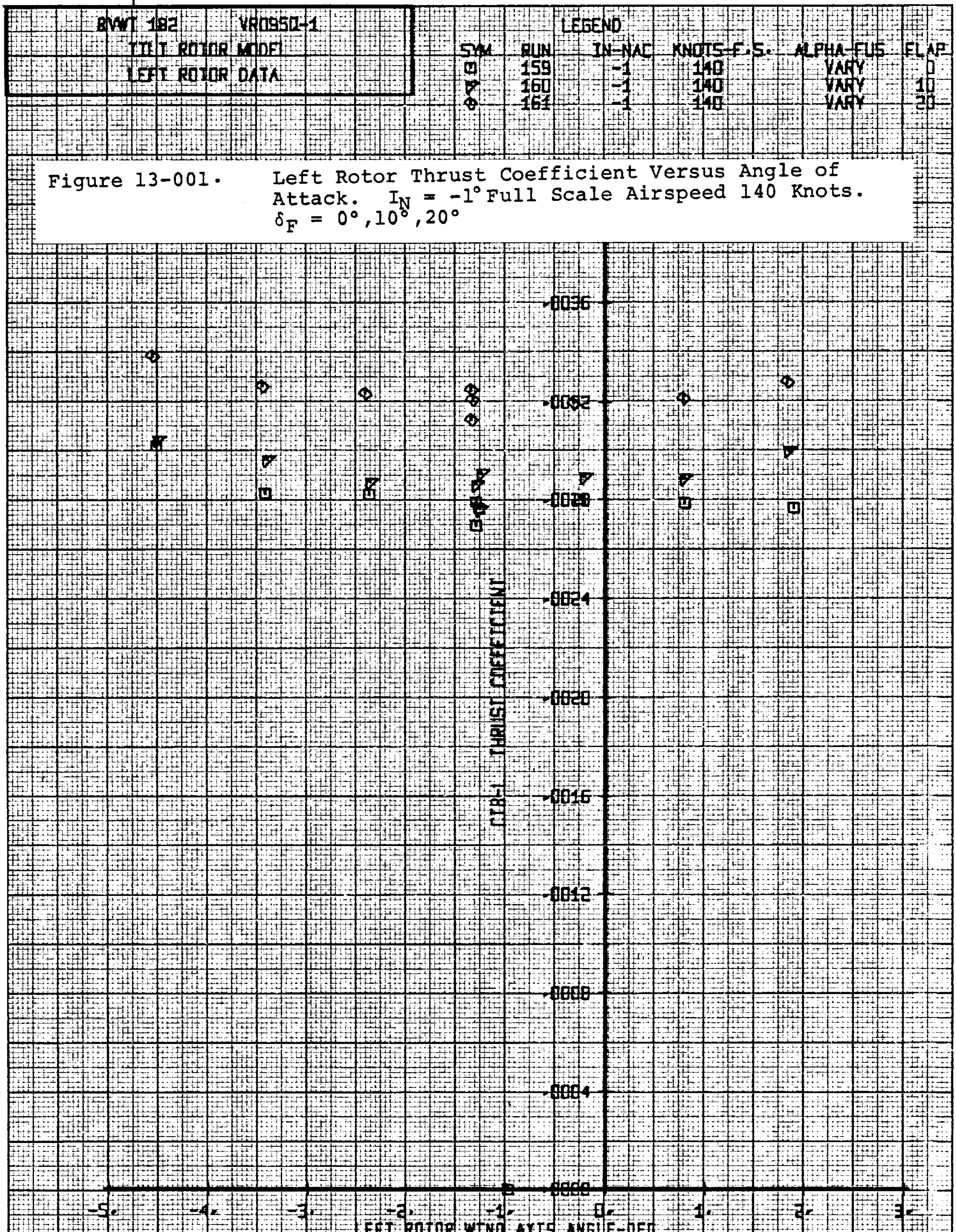


Figure 13-001. Left Rotor Thrust Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0°, 10°, 20°$

SET 110
BVWT 182

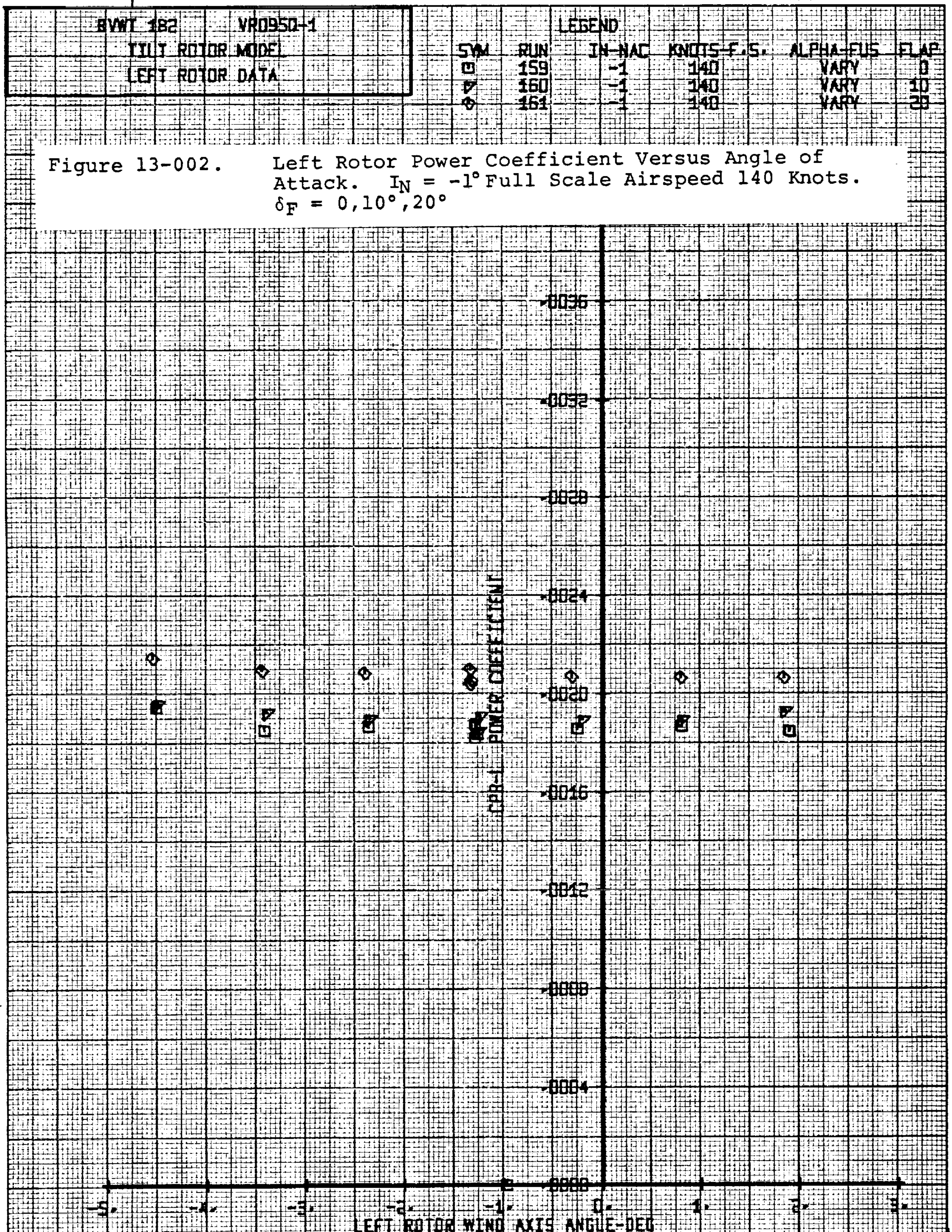


Figure 13-002. Left Rotor Power Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0, 10°, 20°$

110
182

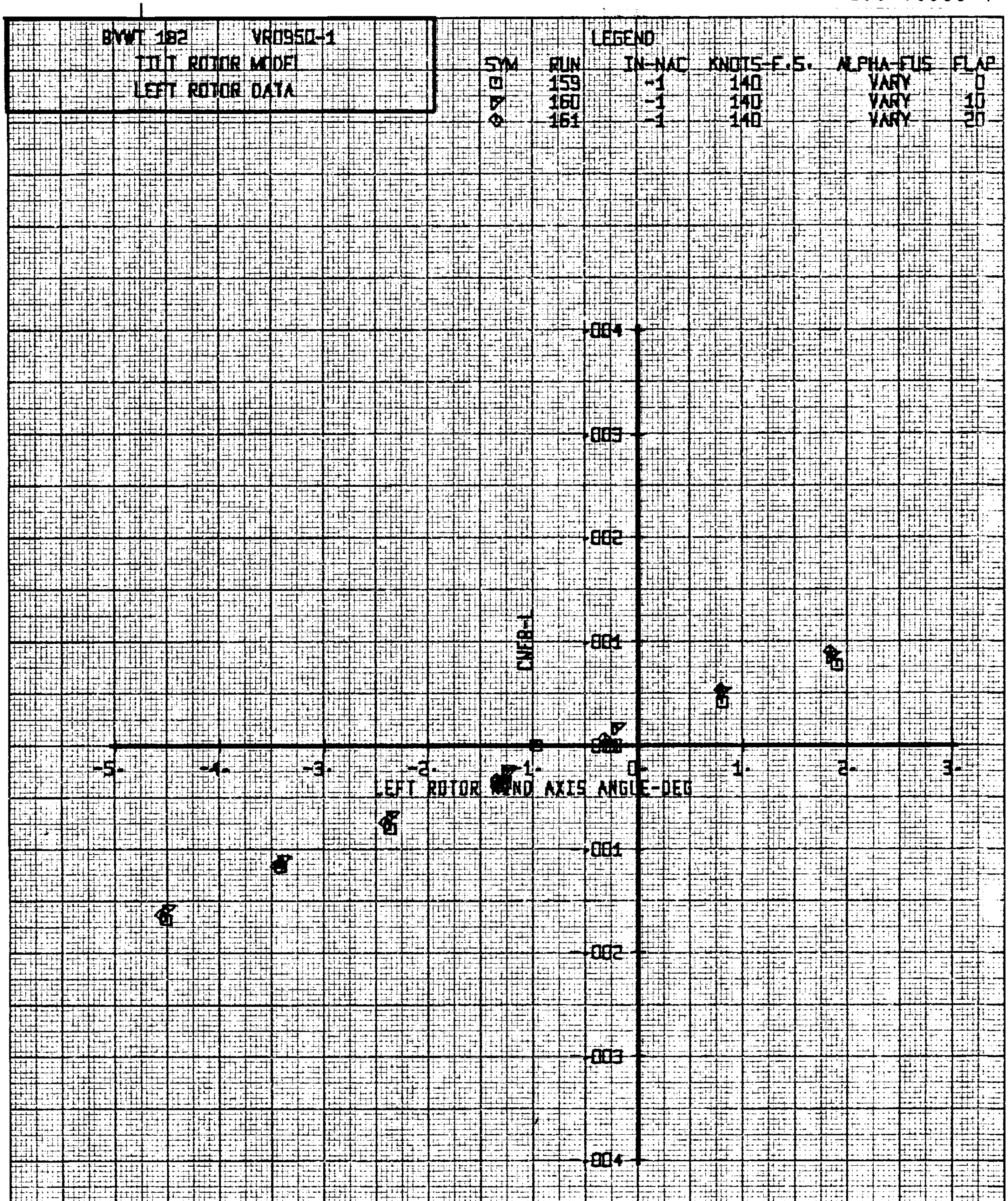


Figure 13-003. Left Rotor Normal Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0, 10° 20°$

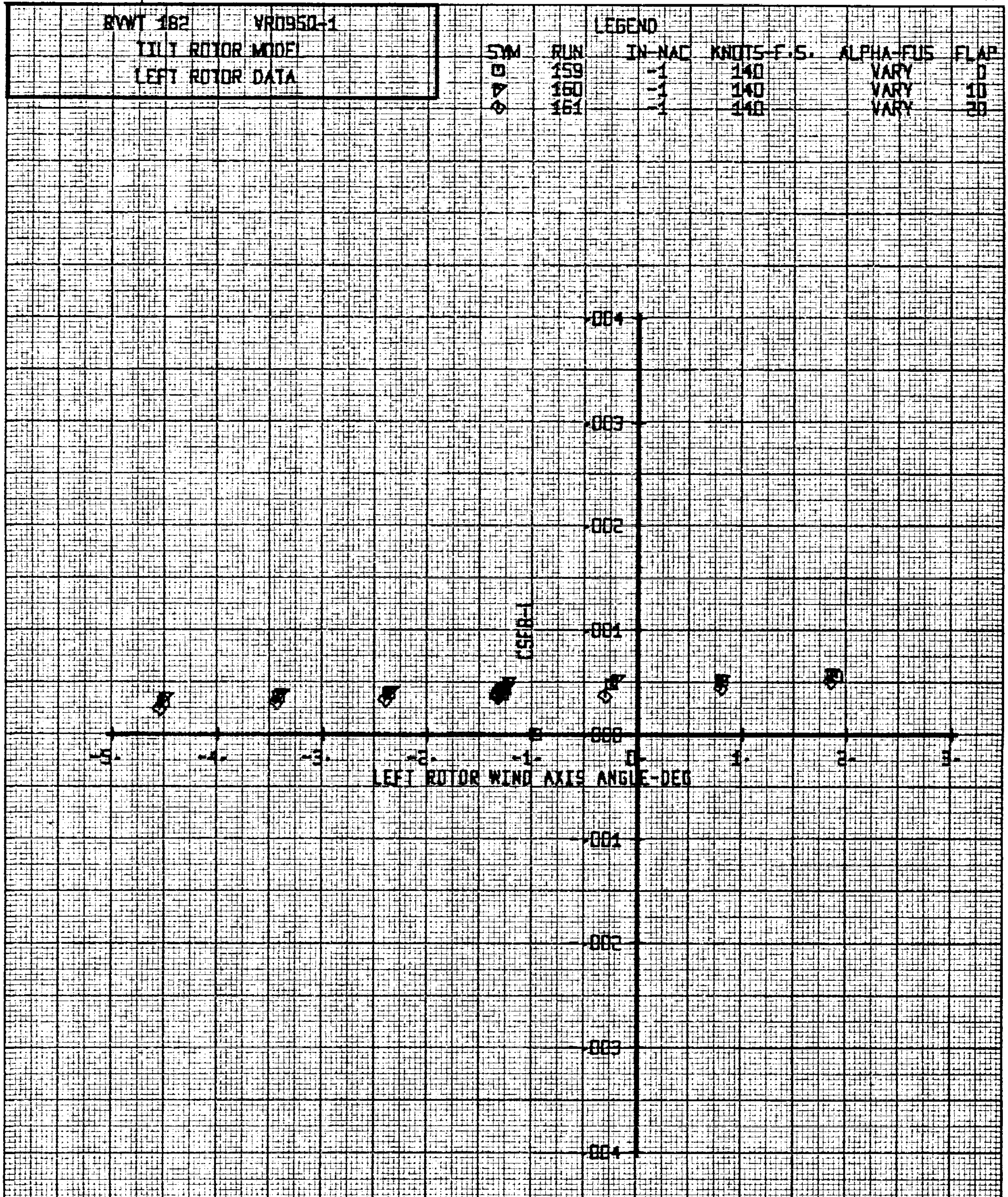


Figure 13-004. Left Rotor Side Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0, 10°, 20°$

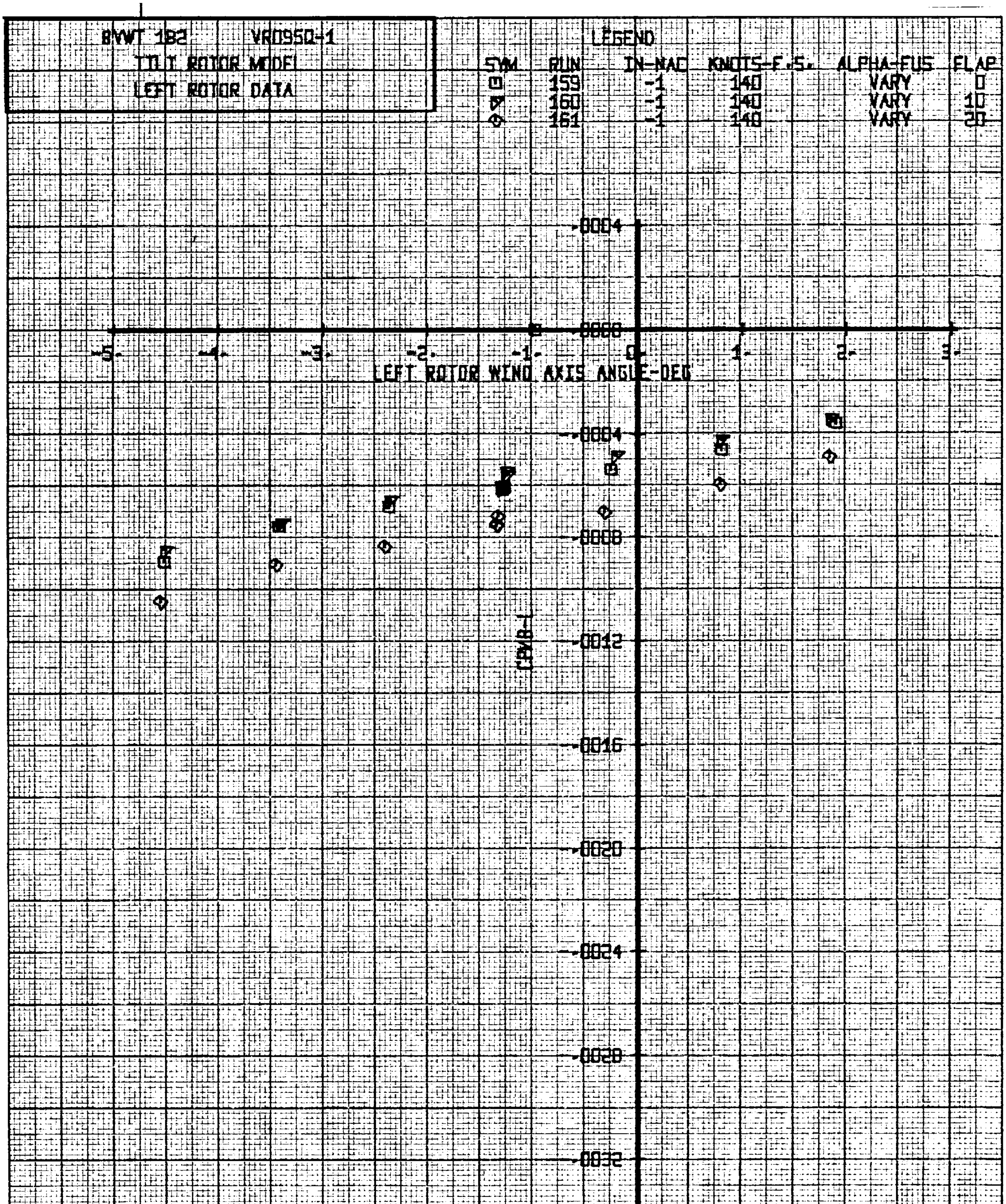


Figure 13-005. Left Rotor Pitching Moment Versus Angle of Attack. I_N = -1° Full Scale Airspeed 140 Knots. δ_F = 0,10°20°

Figure 13-006. Left Rotor Yawing Moment Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0,10°20°$

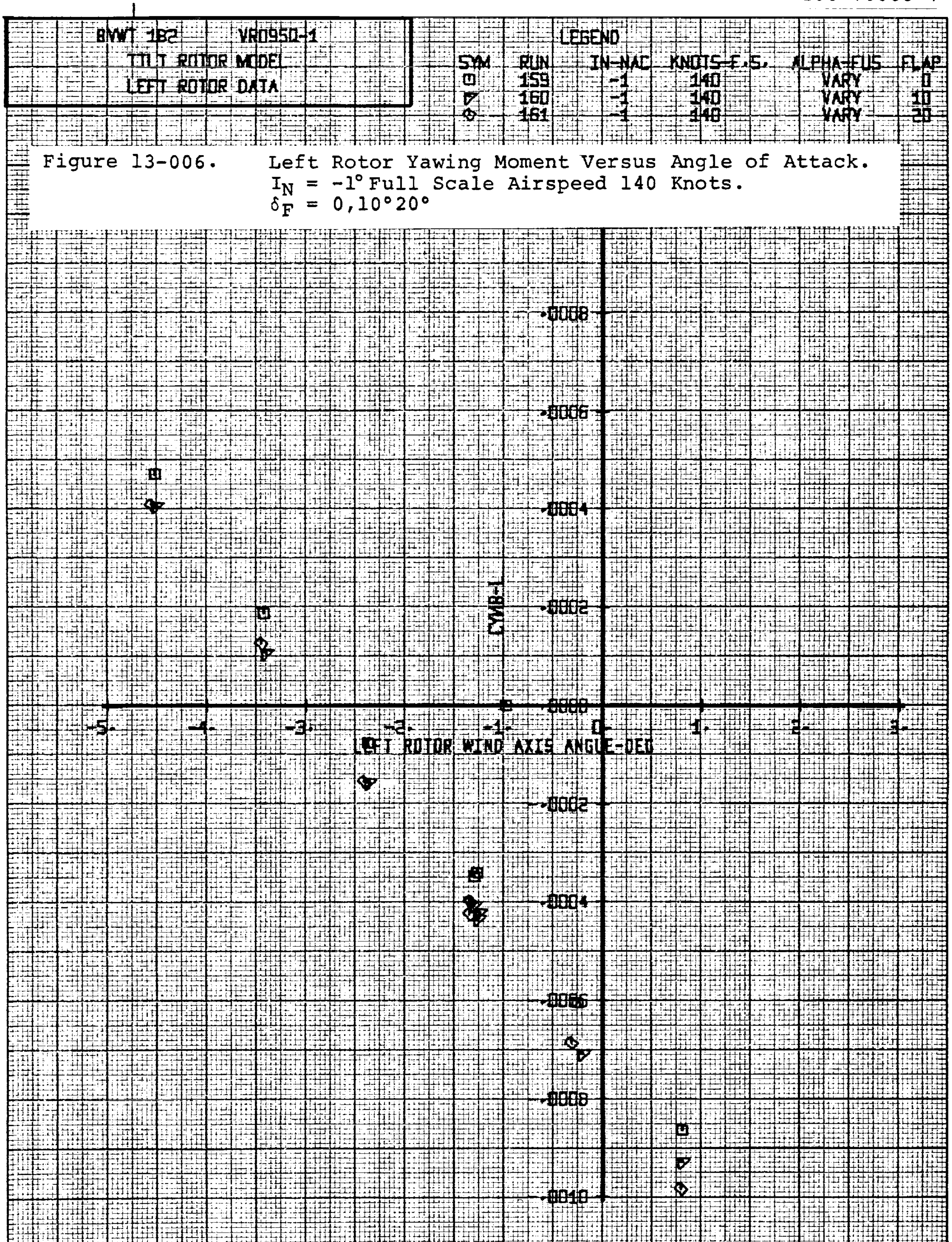
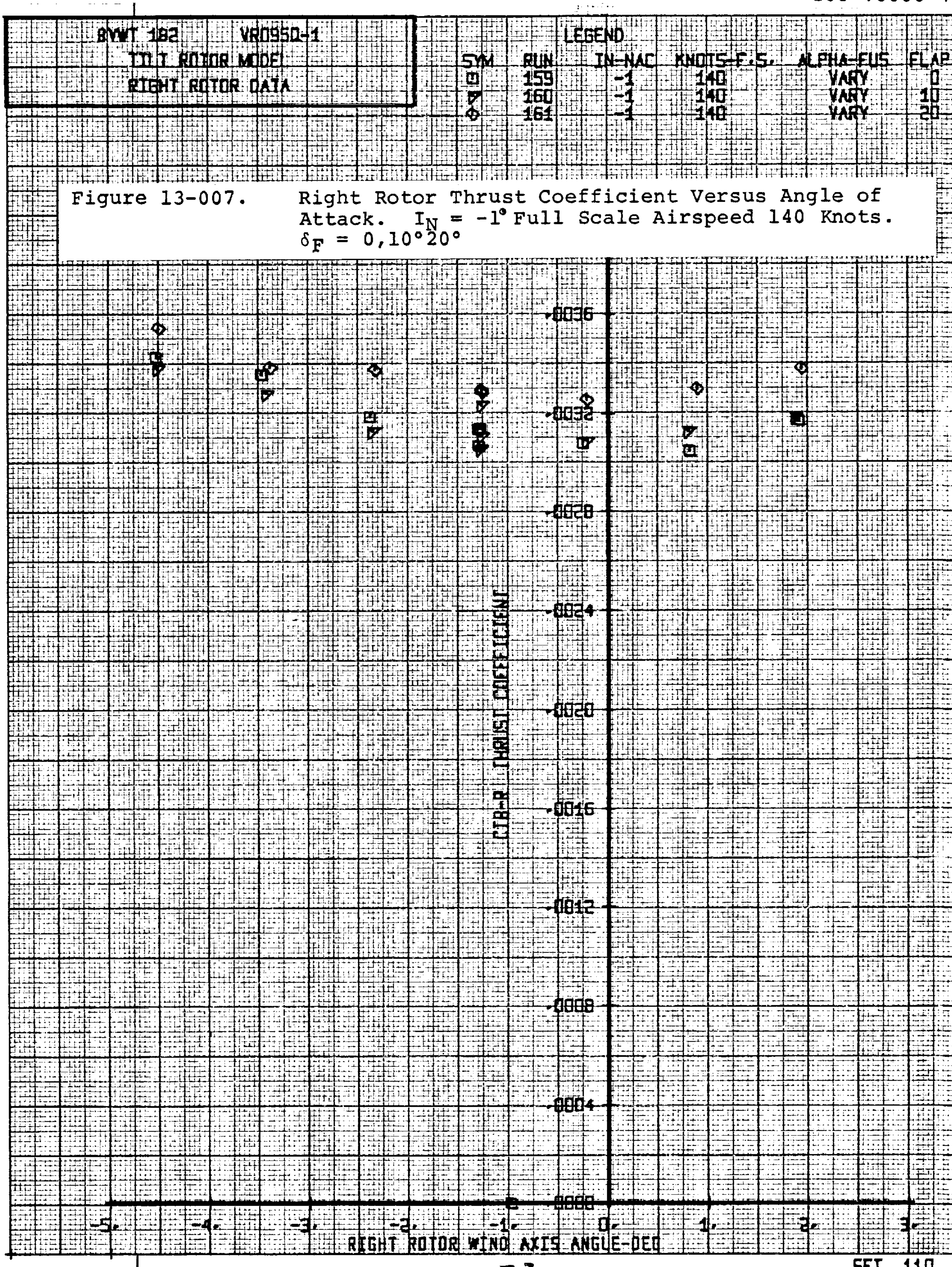


Figure 13-007. Right Rotor Thrust Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0, 10°, 20°$

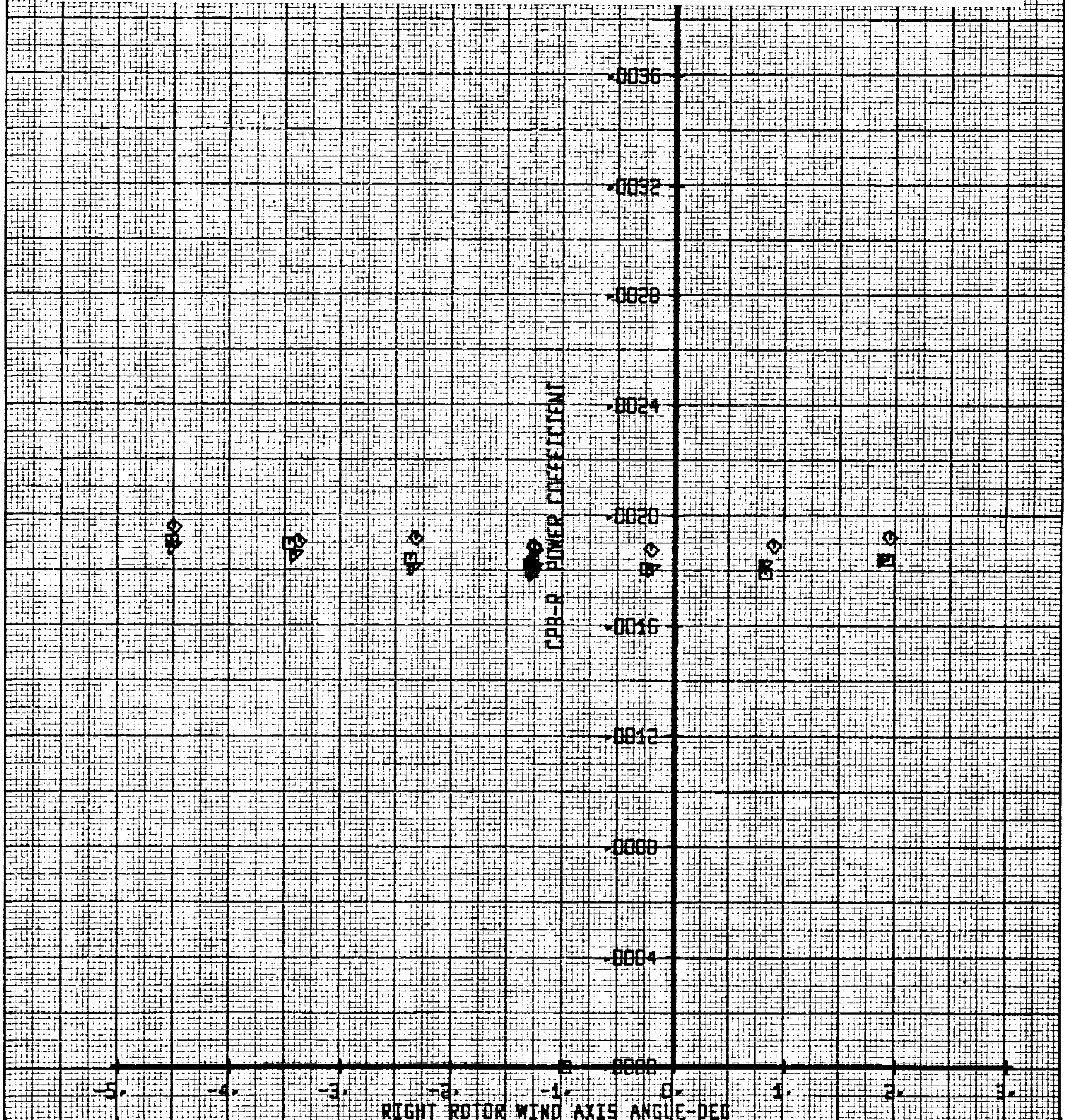


BVWT 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	159	-1	140	VARY	0
▽	160	-1	140	VARY	10
◇	161	-1	140	VARY	20

Figure 13-008. Right Rotor Power Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0,10°20°$



110
182

SET 110
BVWT 182

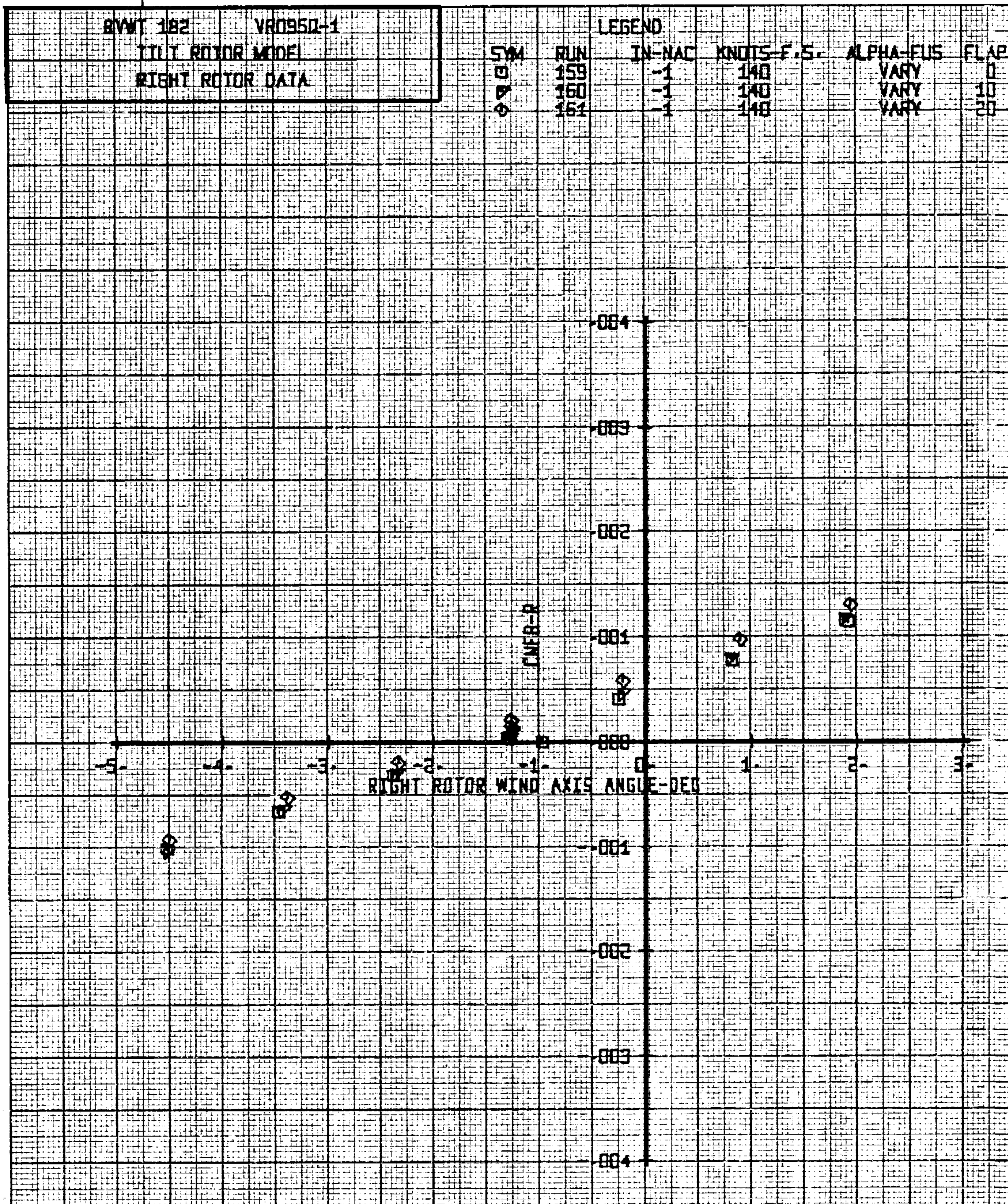


Figure 13-009. Right Rotor Normal Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0, 10° 20°$

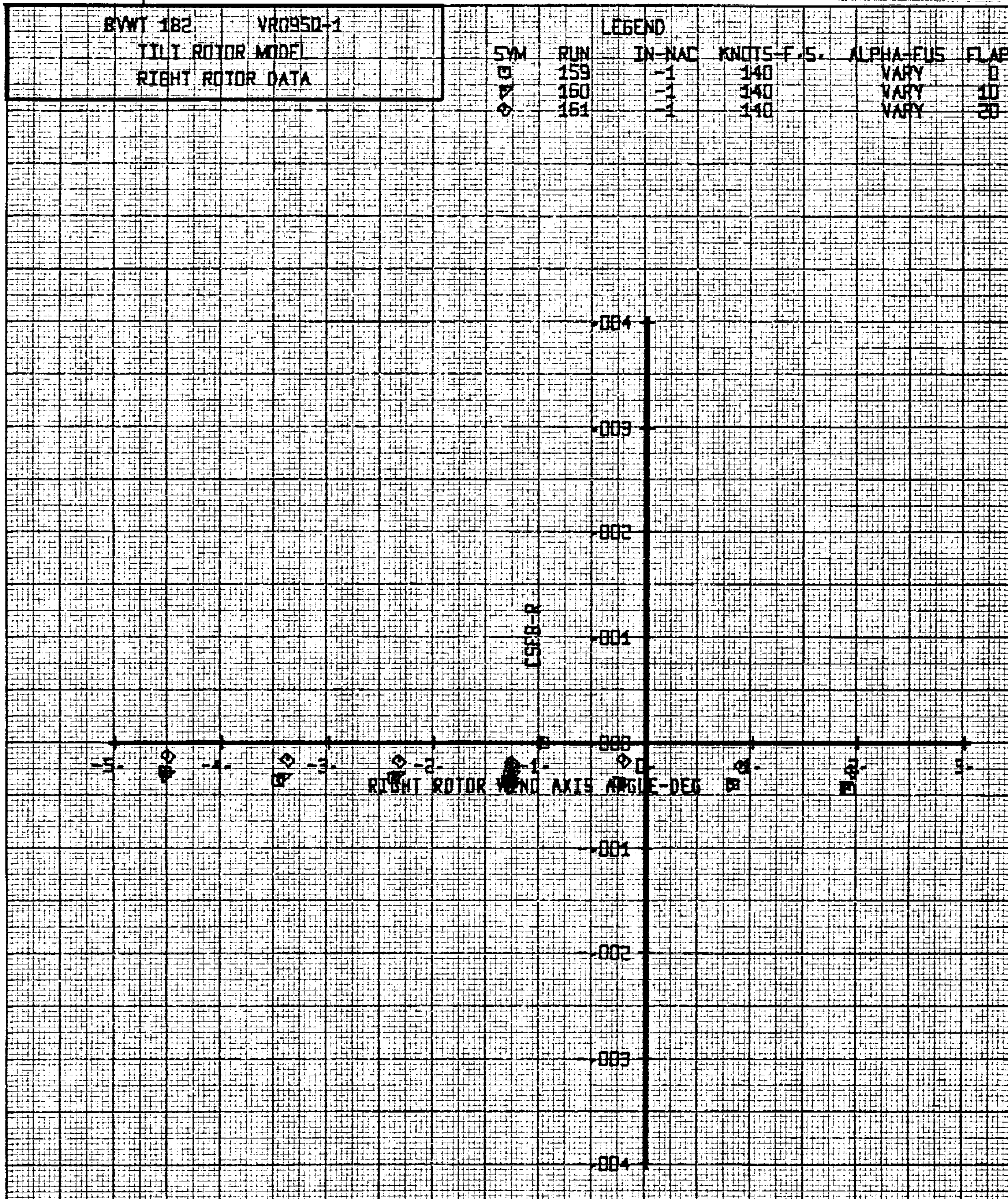


Figure 13-010. Right Rotor Side Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0, 10° 20°$

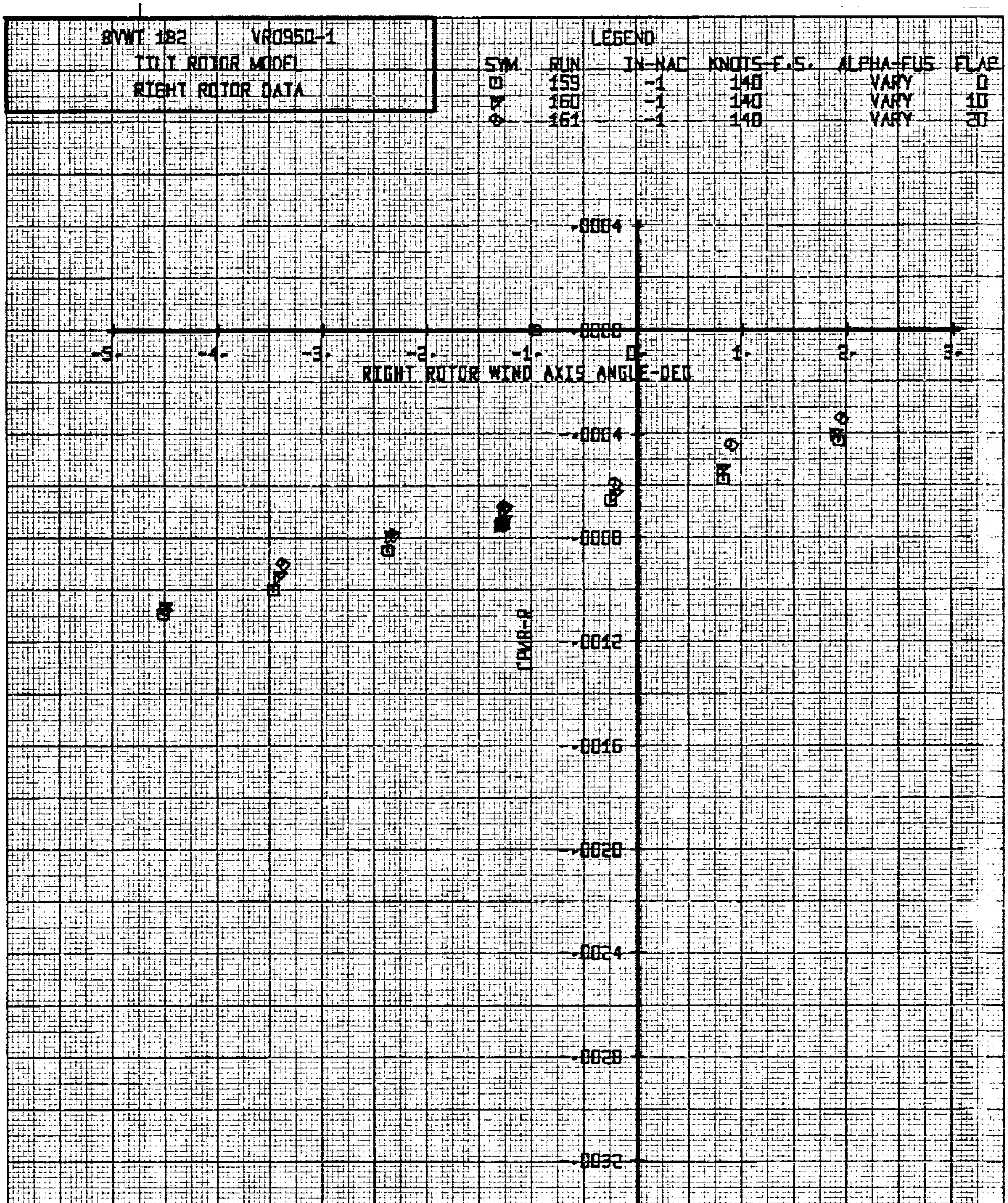


Figure 13-011. Right Rotor Pitching Moment Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0, 10° 20°$

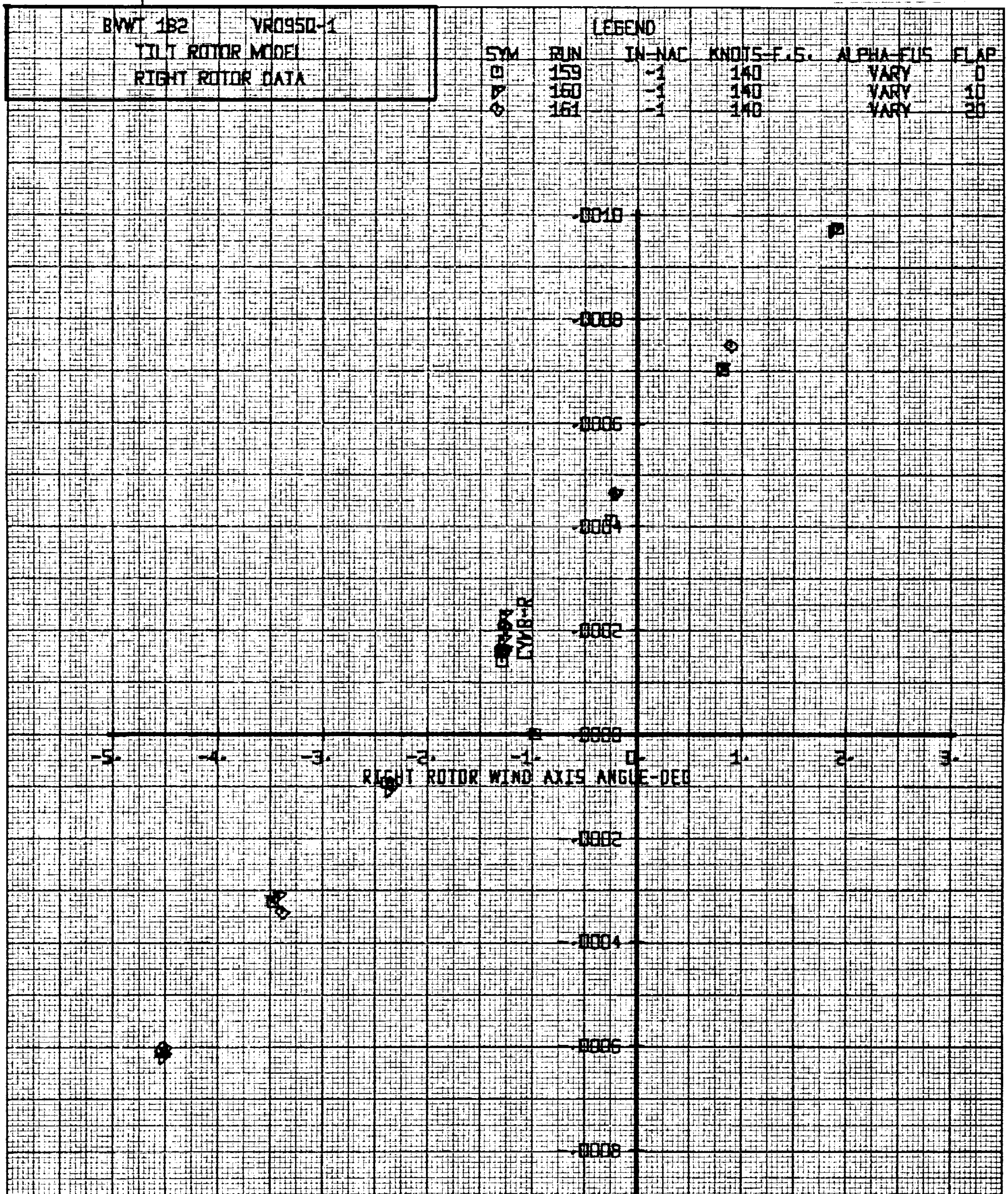


Figure 13-012. Right Rotor Yawing Moment Versus Angle of Attack.
$I_N = -1°$ Full Scale Airspeed 140 Knots.
$\delta_F = 0,10°20°$

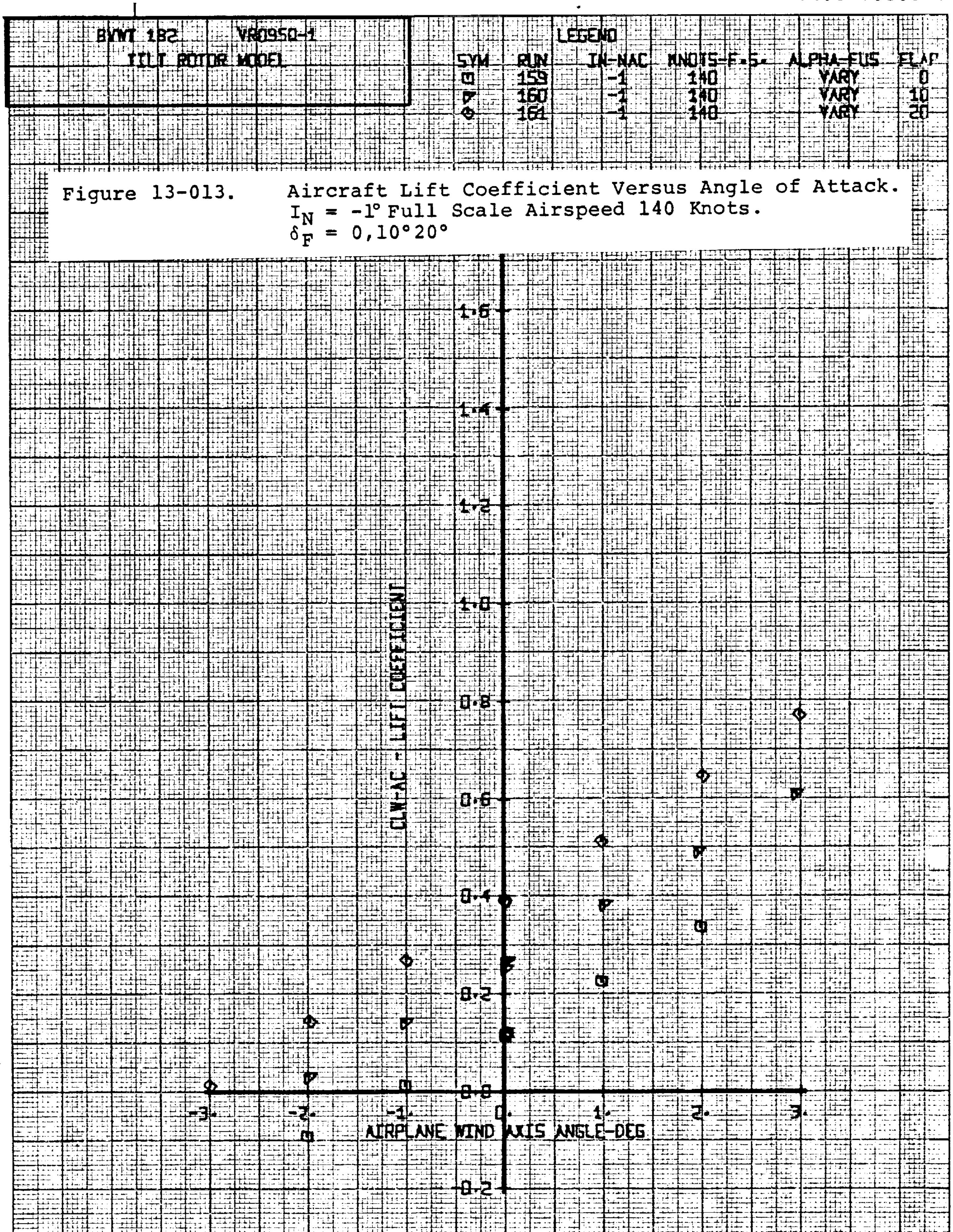


Figure 13-013. Aircraft Lift Coefficient Versus Angle of Attack.
I_N = -1° Full Scale Airspeed 140 Knots.
δ_F = 0,10°20°

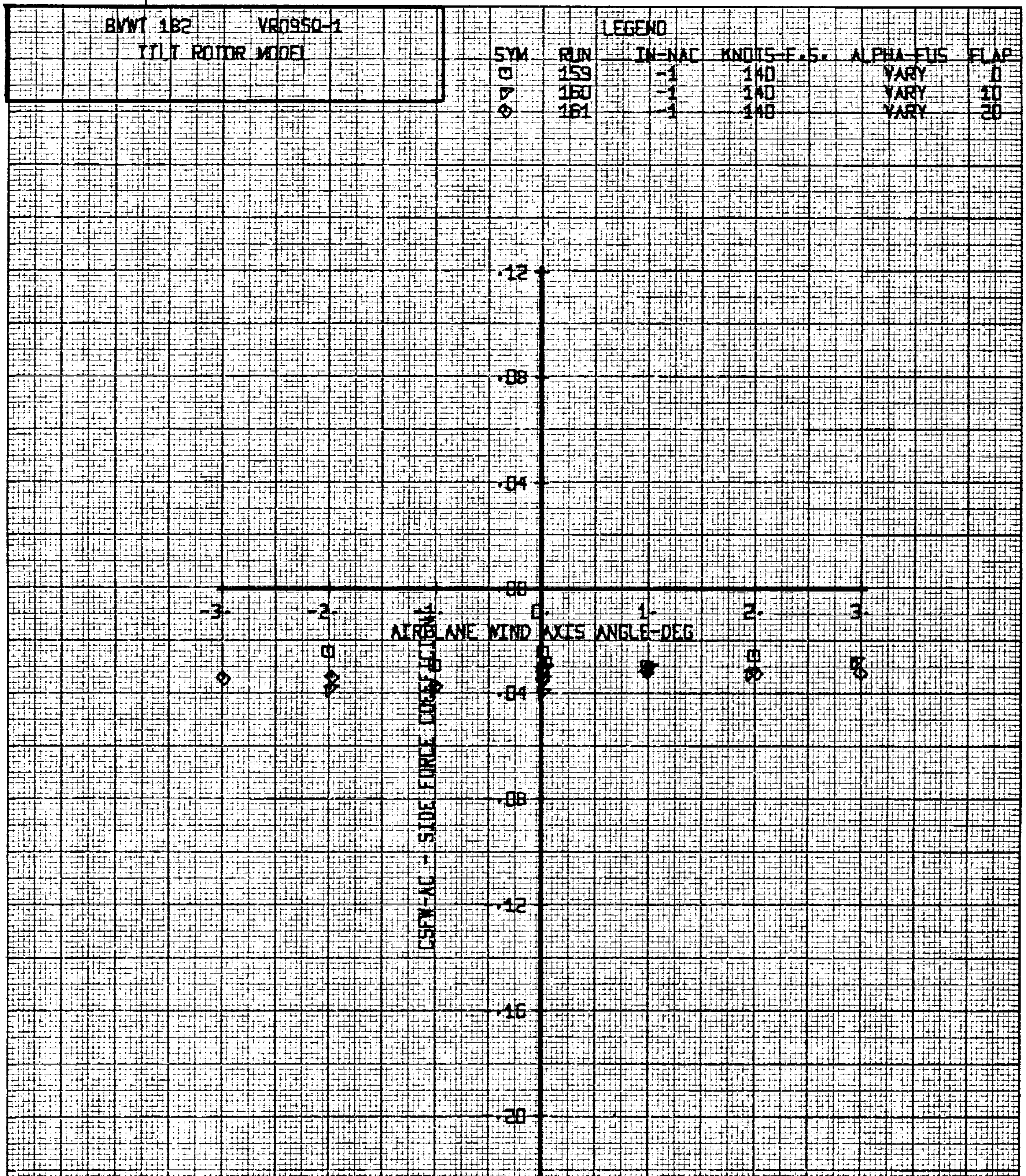


Figure 13-014. Aircraft Side Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0, 10° 20°$

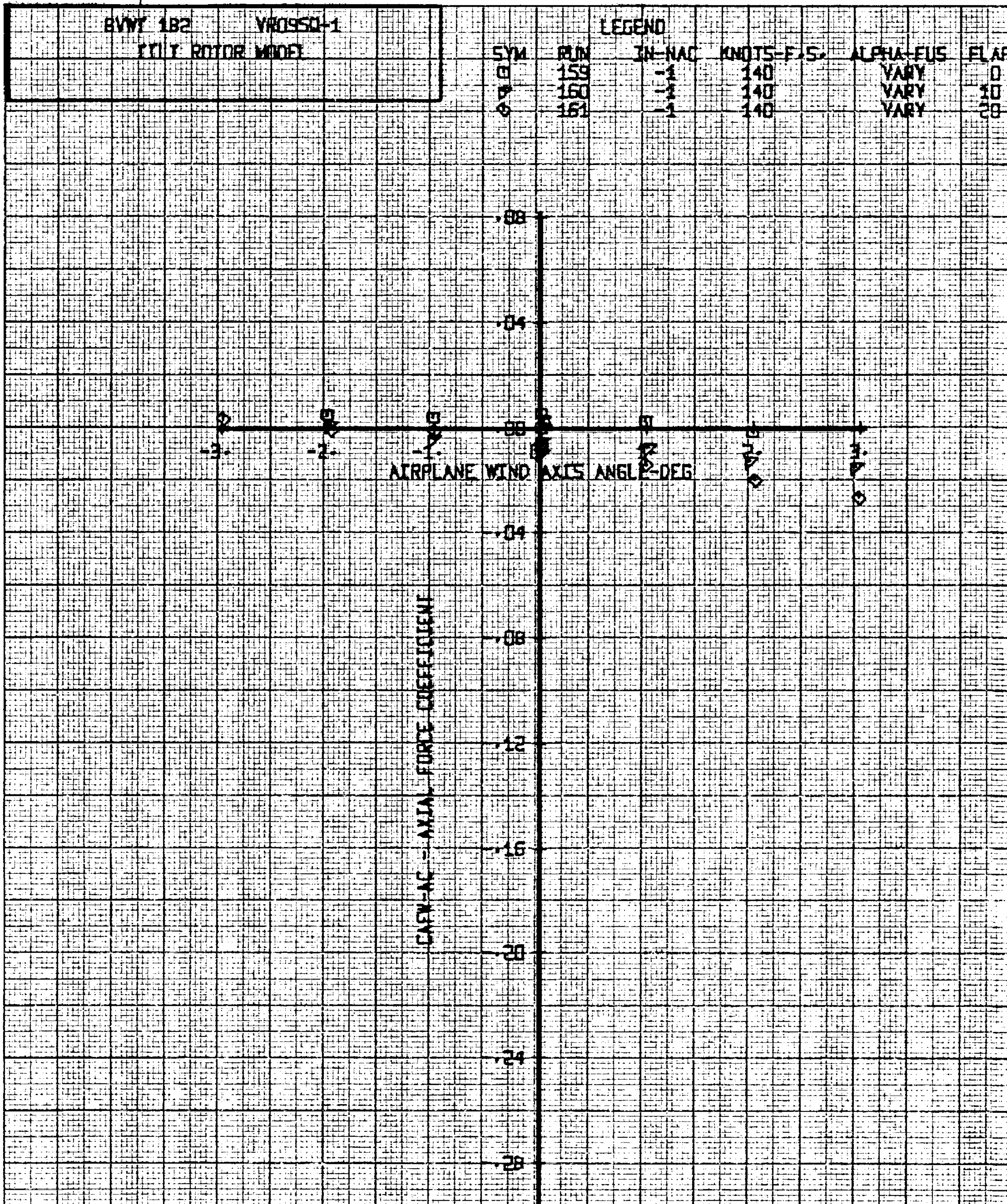


Figure 13-015. Aircraft Axial Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0,10°20°$

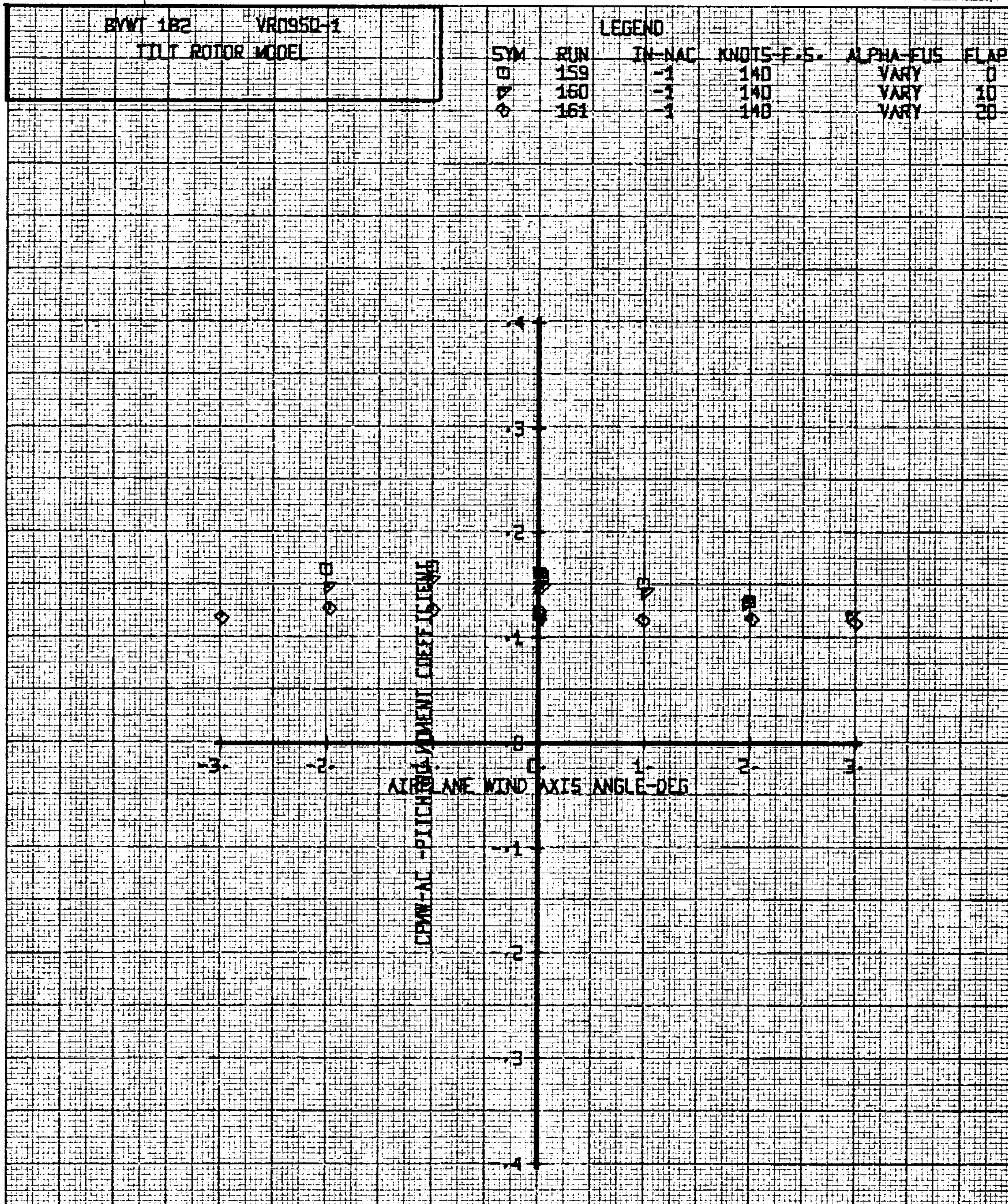


Figure 13-016. Aircraft Pitching Moment Versus Angle of Attack.
I_N = -1° Full Scale Airspeed 140 Knots.
δ_F = 0,10°20°

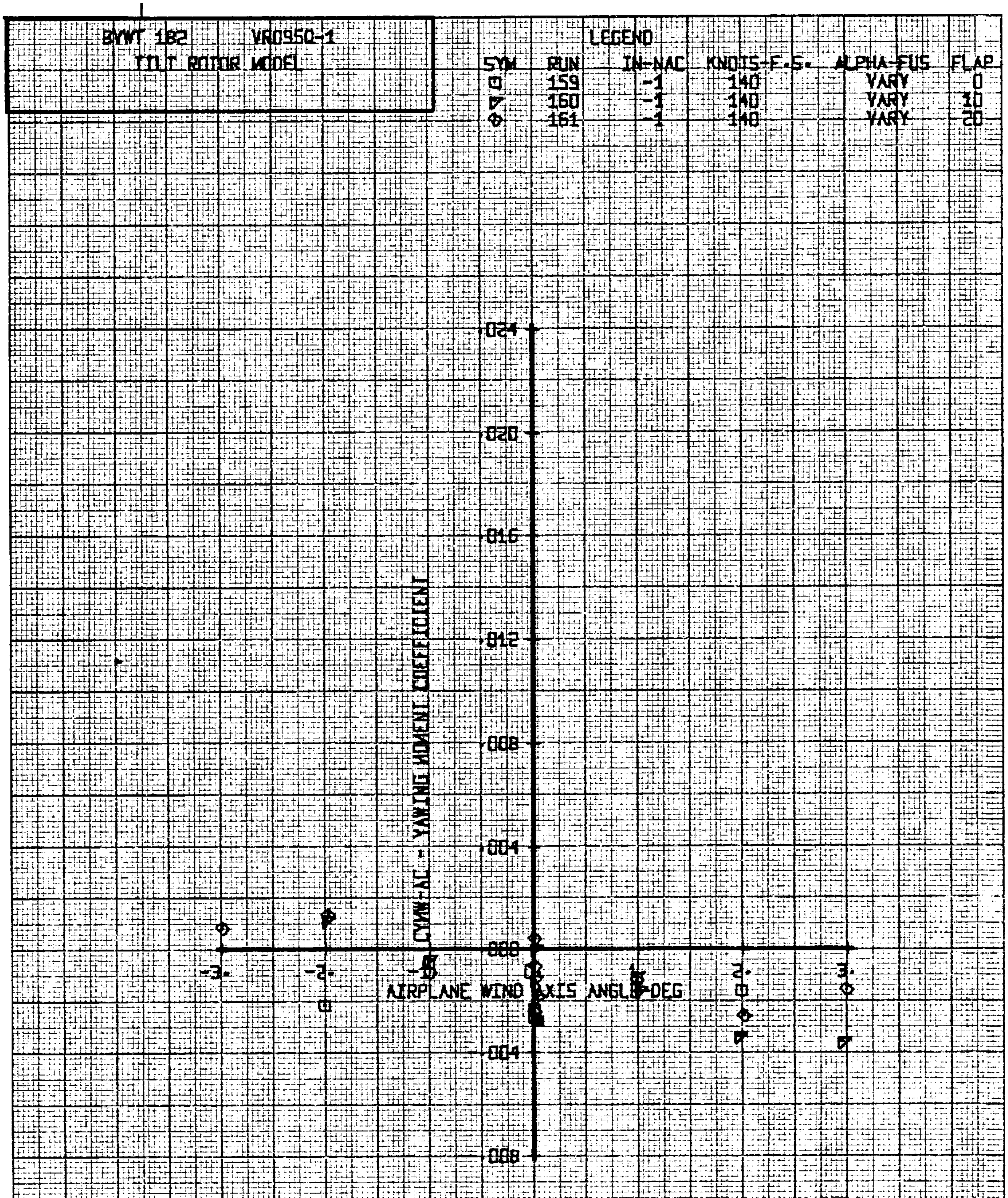


Figure 13-017. Aircraft Yawing Moment Versus Angle of Attack.
I_N = -1° Full Scale Airspeed 140 Knots.
δ_F = 0,10°20°

SET 110
BVWT 182

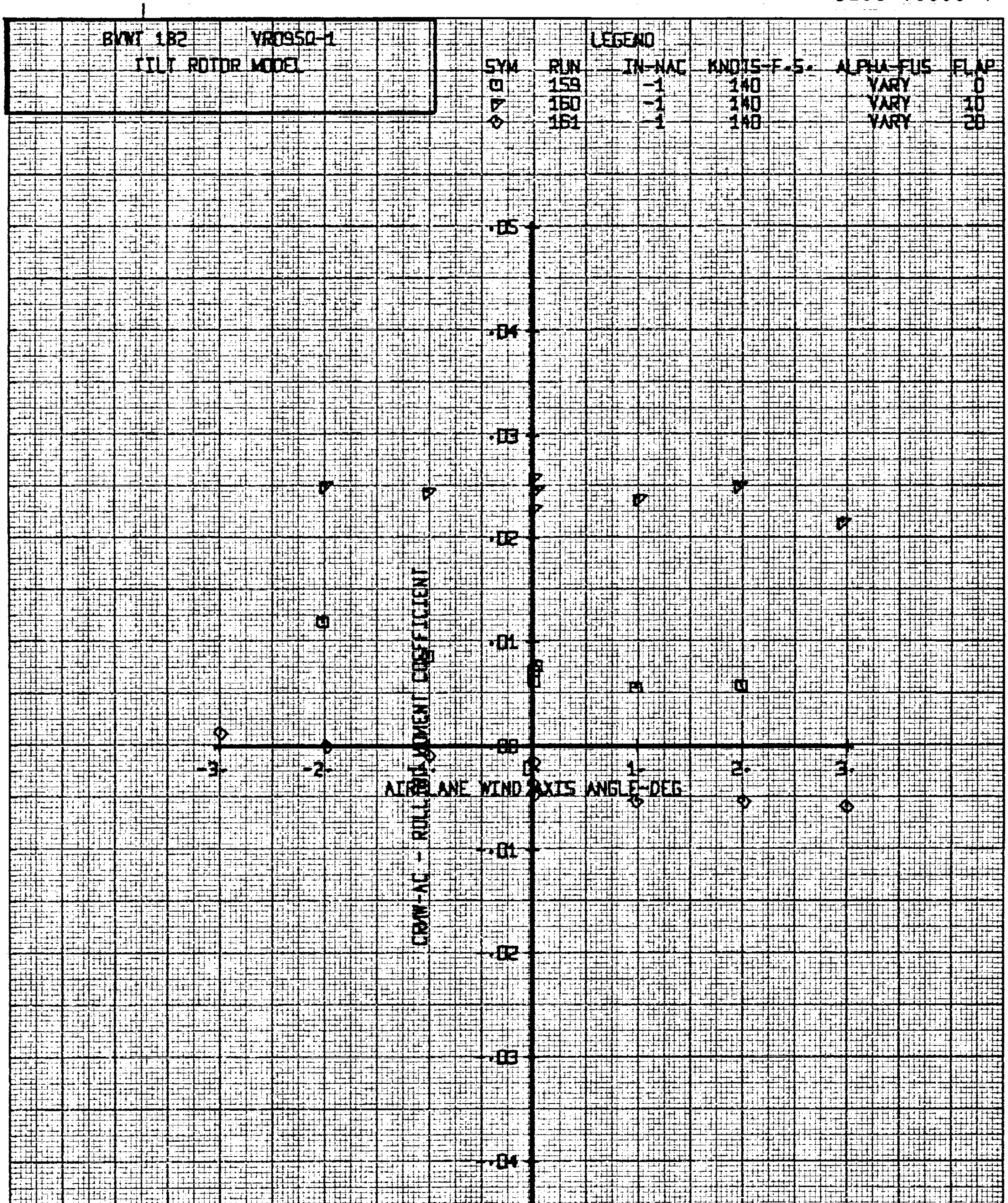


Figure 13-018. Aircraft Rolling Moment Versus Angle of Attack.
I_N = -1° Full Scale Airspeed 140 Knots.
δ_F = 0,10°20°

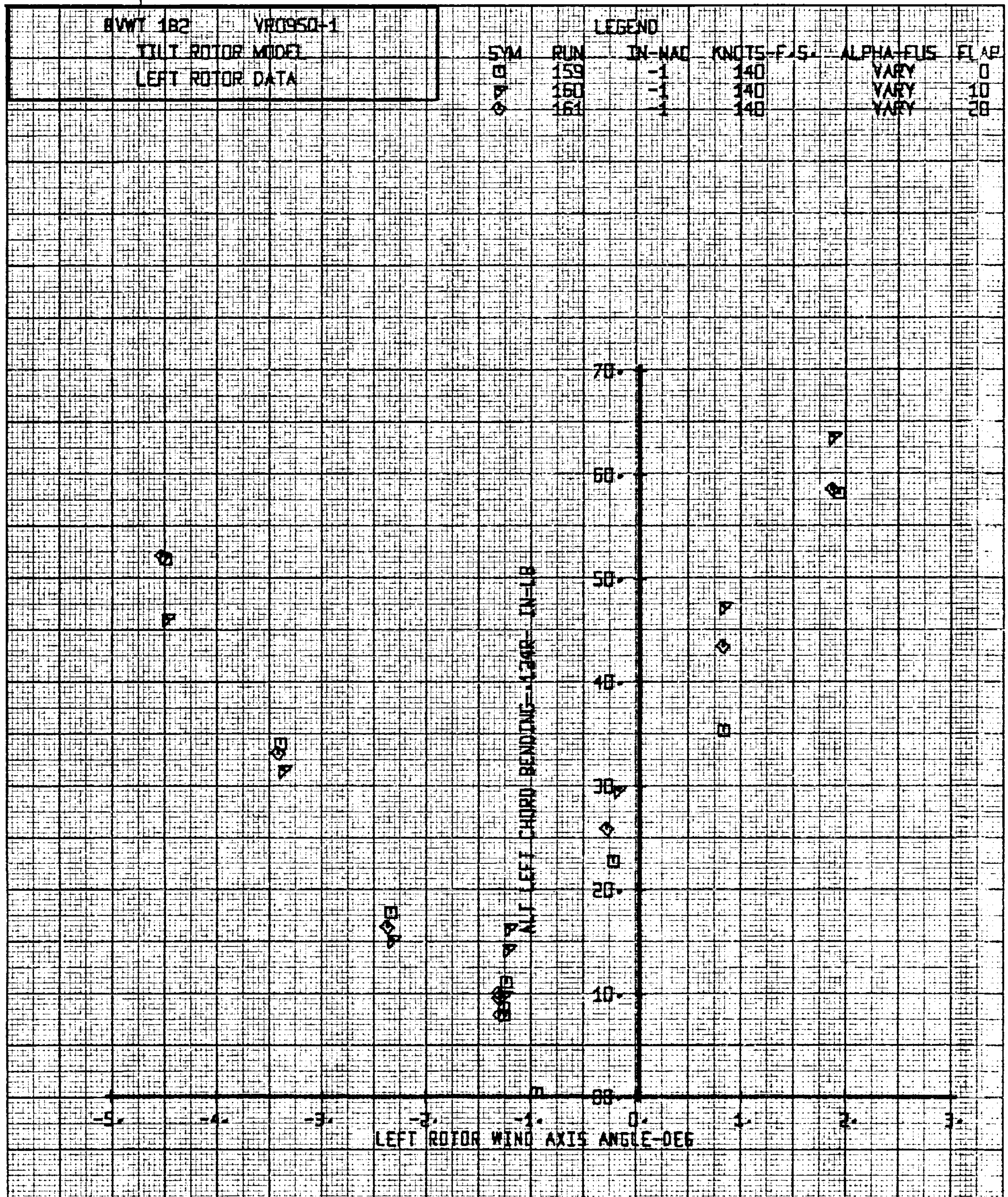


Figure 13-019. Alt. Left Chord Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta F = 0, 10° 20°$

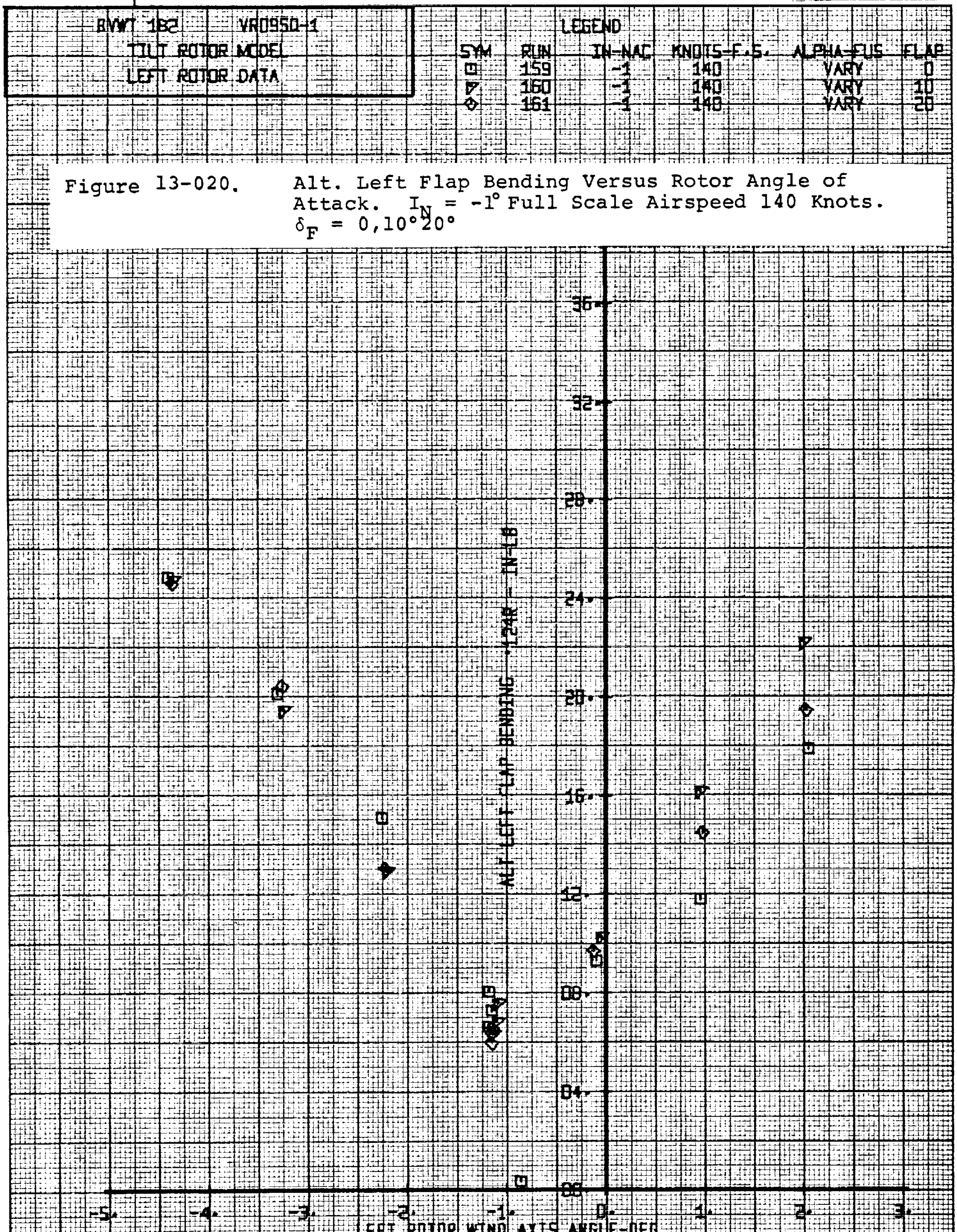


Figure 13-020. Alt. Left Flap Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0, 10°, 20°$

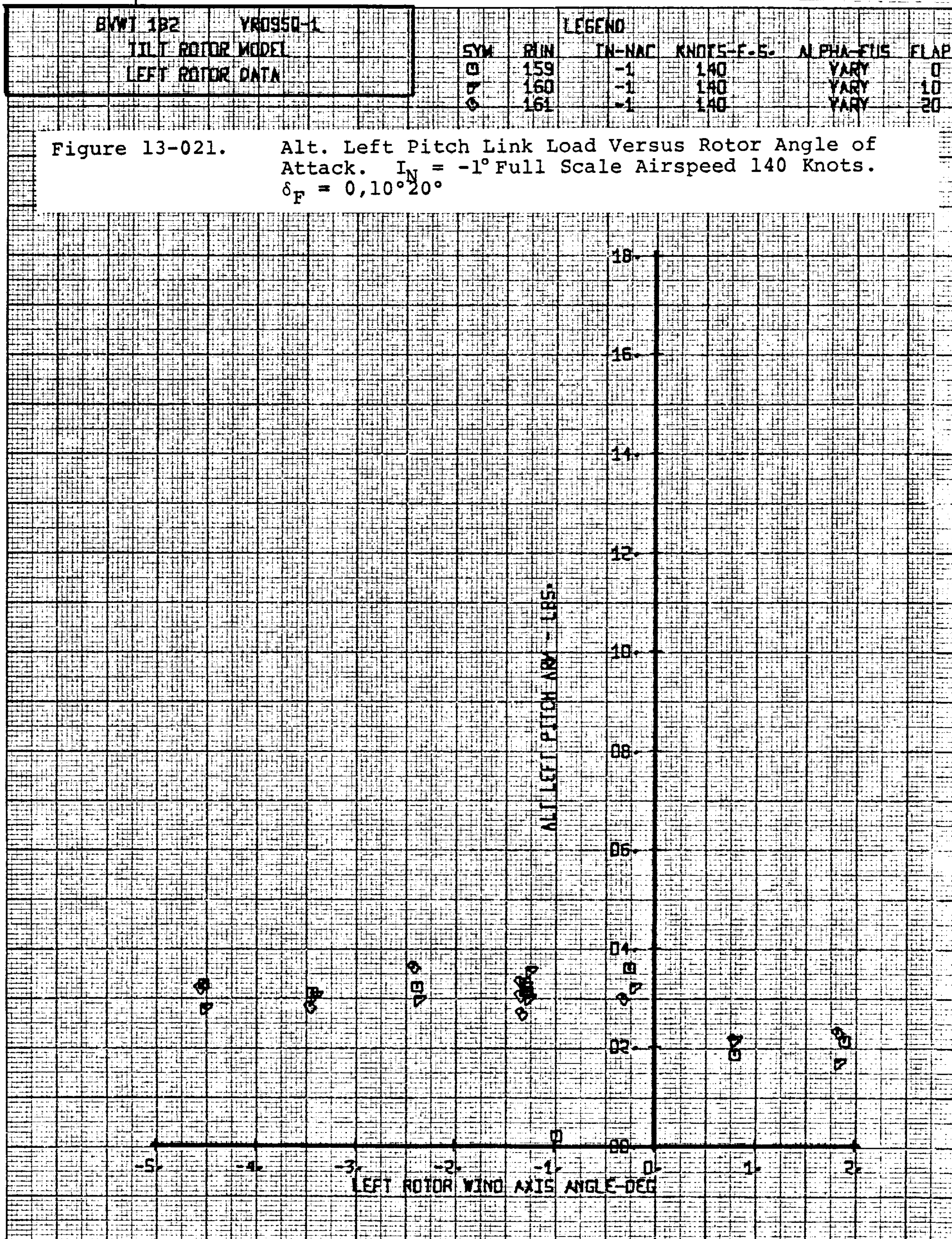


Figure 13-021. Alt. Left Pitch Link Load Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0, 10° 20°$

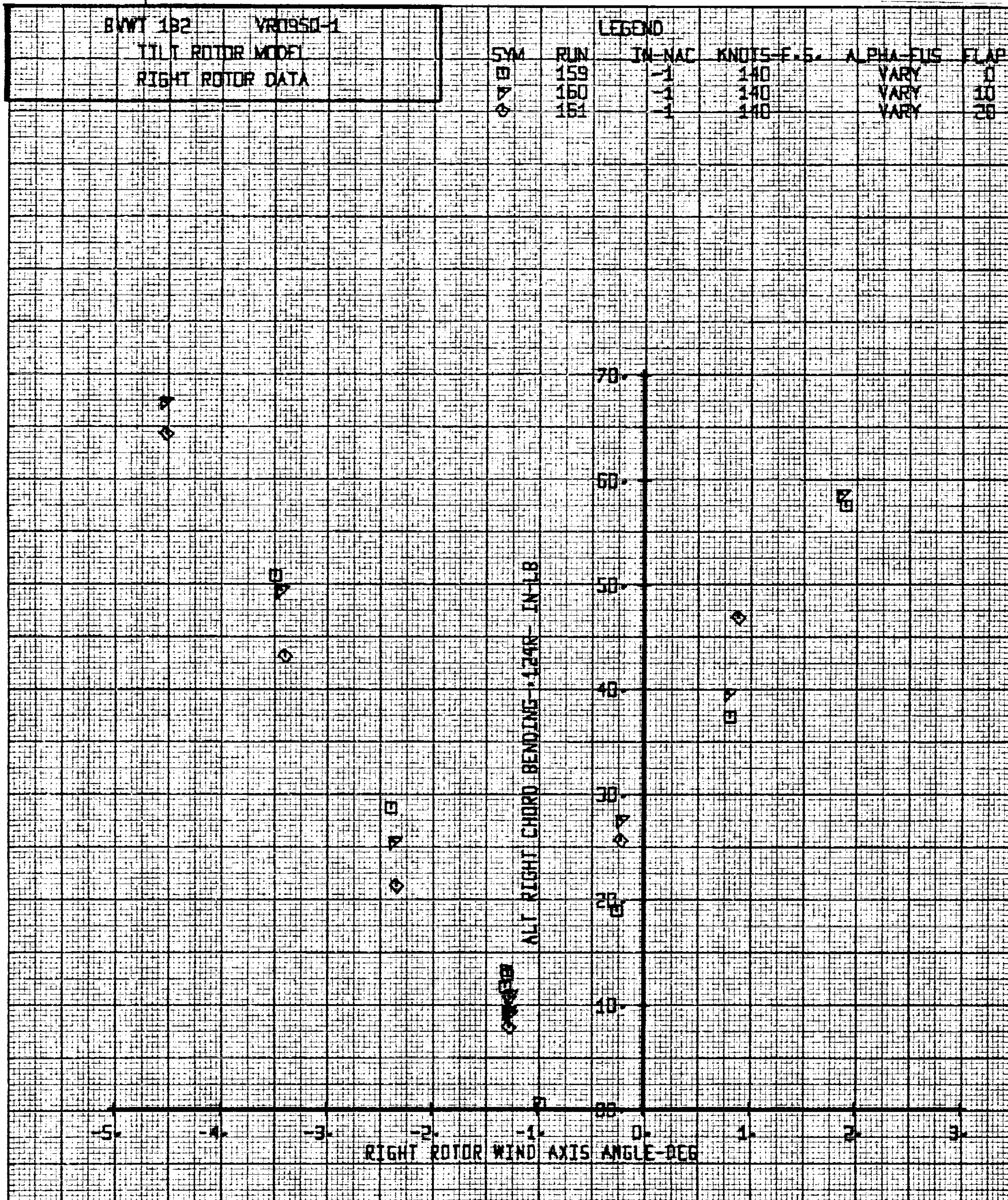


Figure 13-022. Alt. Right Chord Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0, 10°20°$

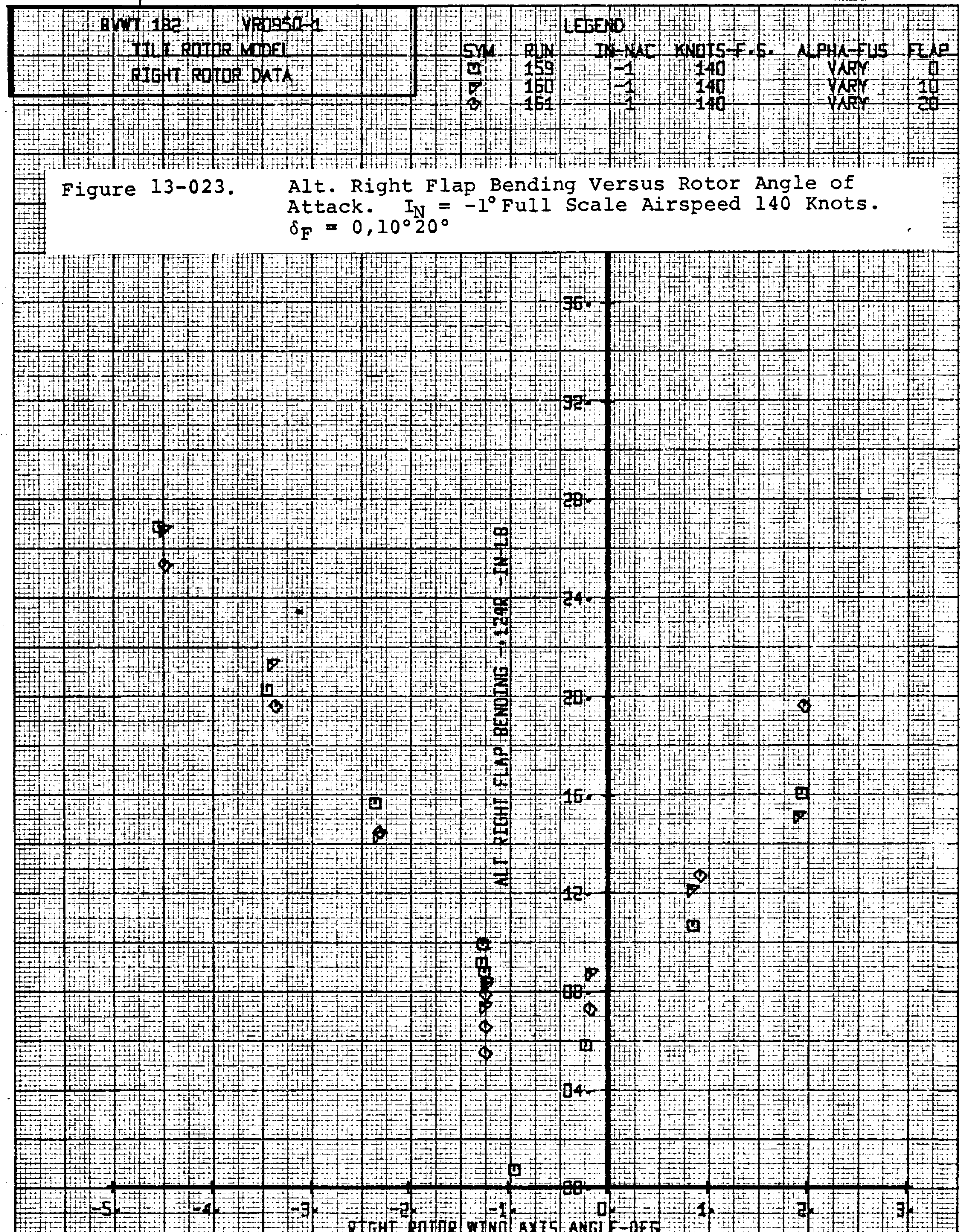
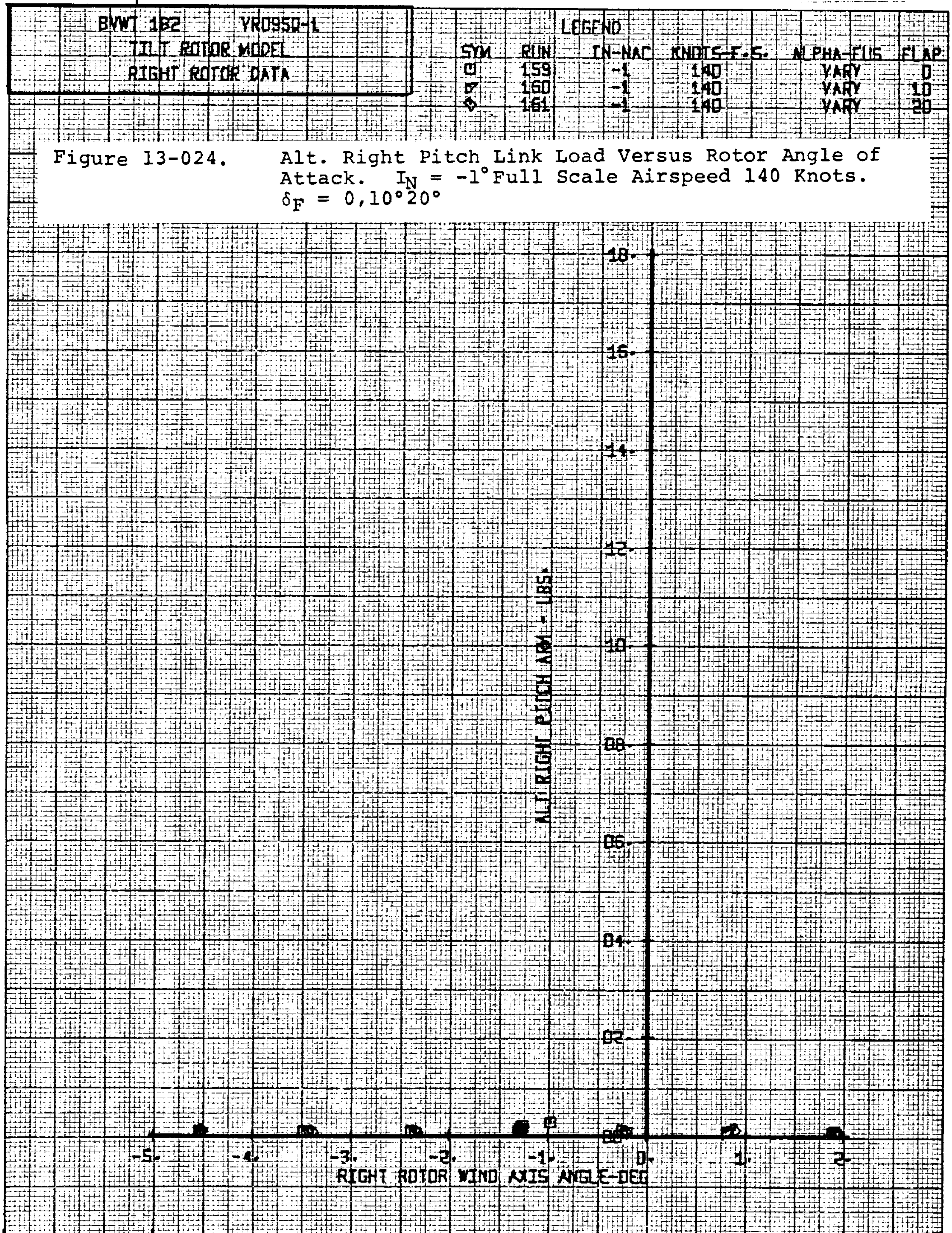


Figure 13-023. Alt. Right Flap Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0, 10° 20°$

Figure 13-024. Alt. Right Pitch Link Load Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 140 Knots. $\delta_F = 0, 10°20°$



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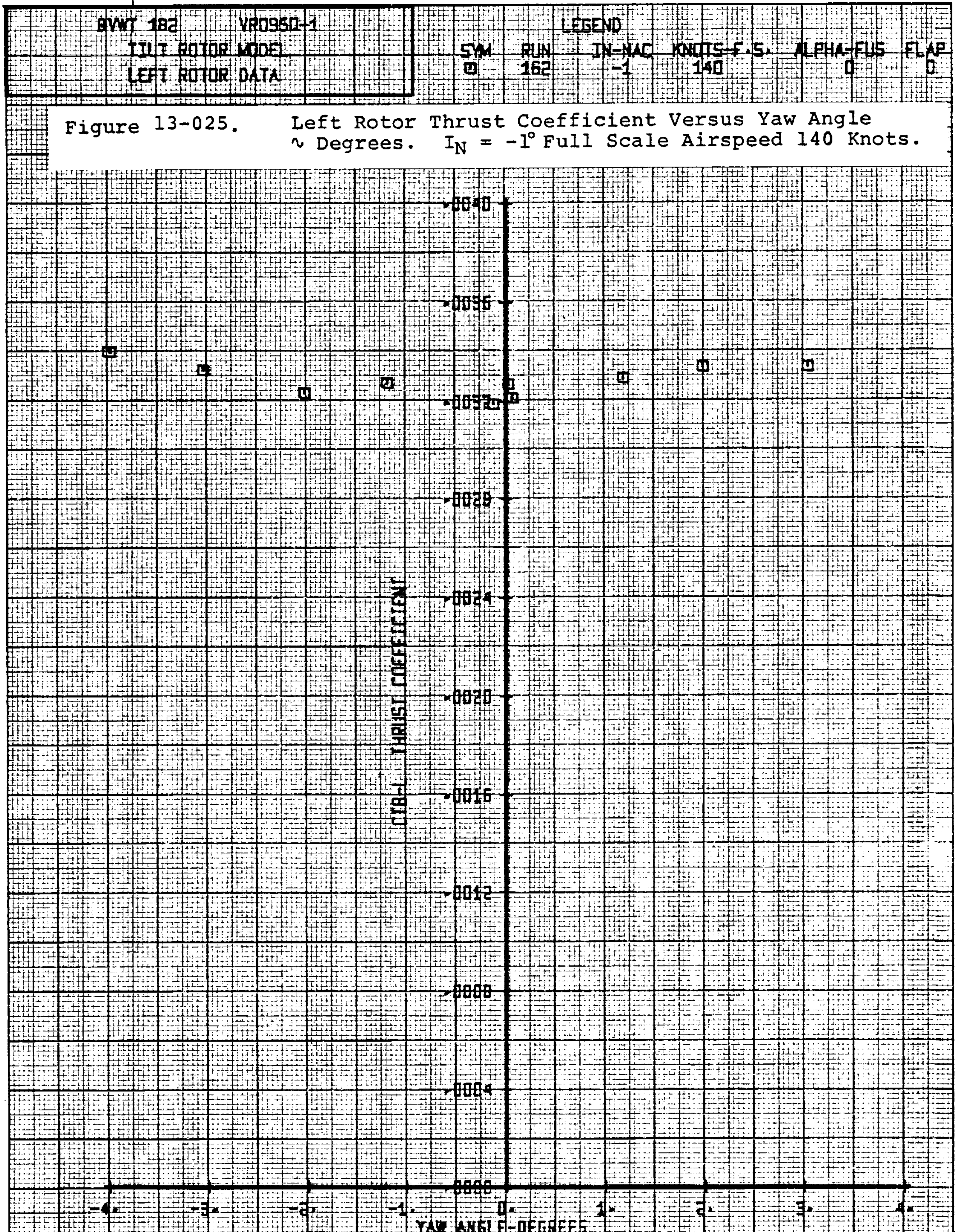

Figure 13-025. Left Rotor Thrust Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1^\circ$ Full Scale Airspeed 140 Knots.

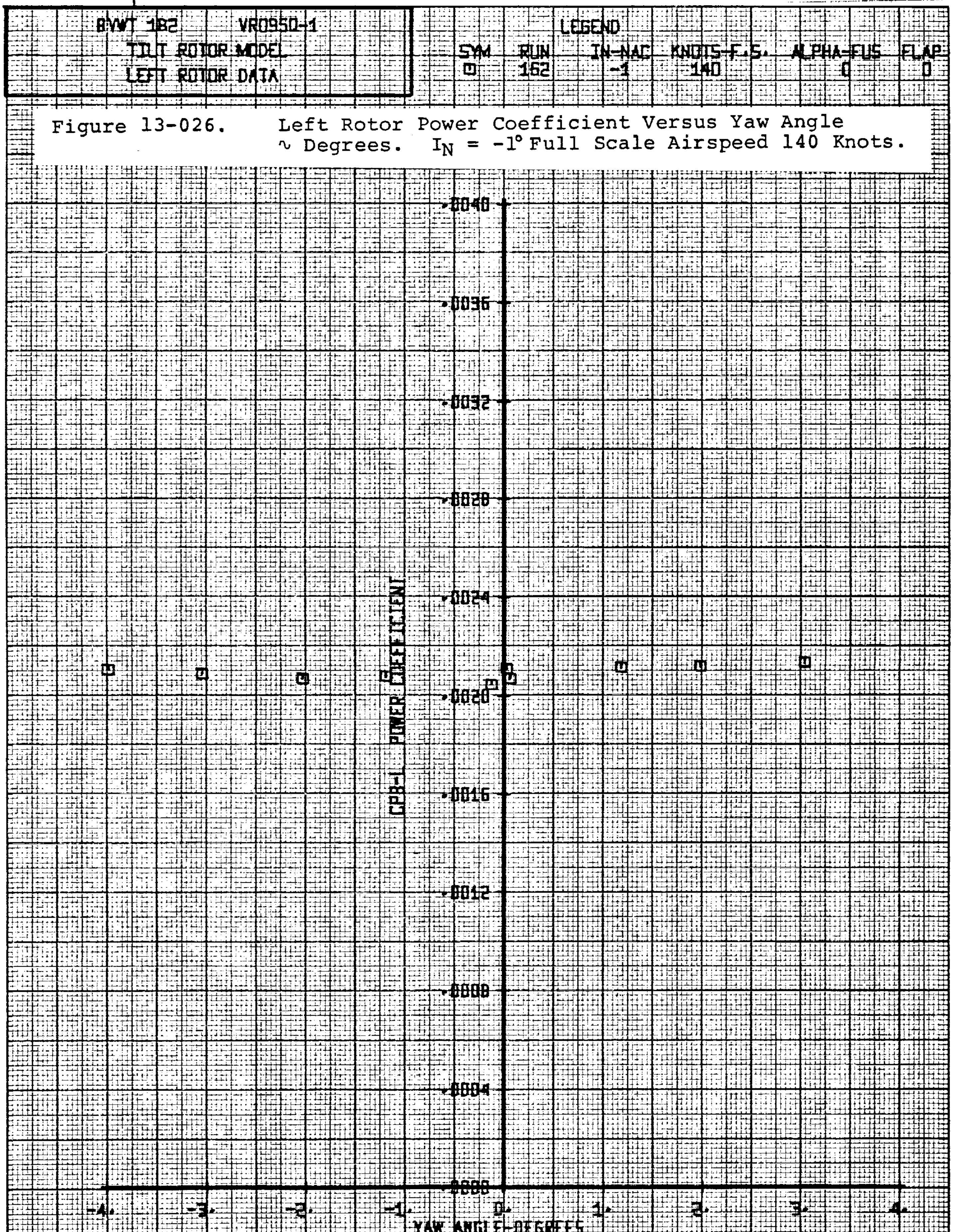

Figure 13-026. Left Rotor Power Coefficient Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

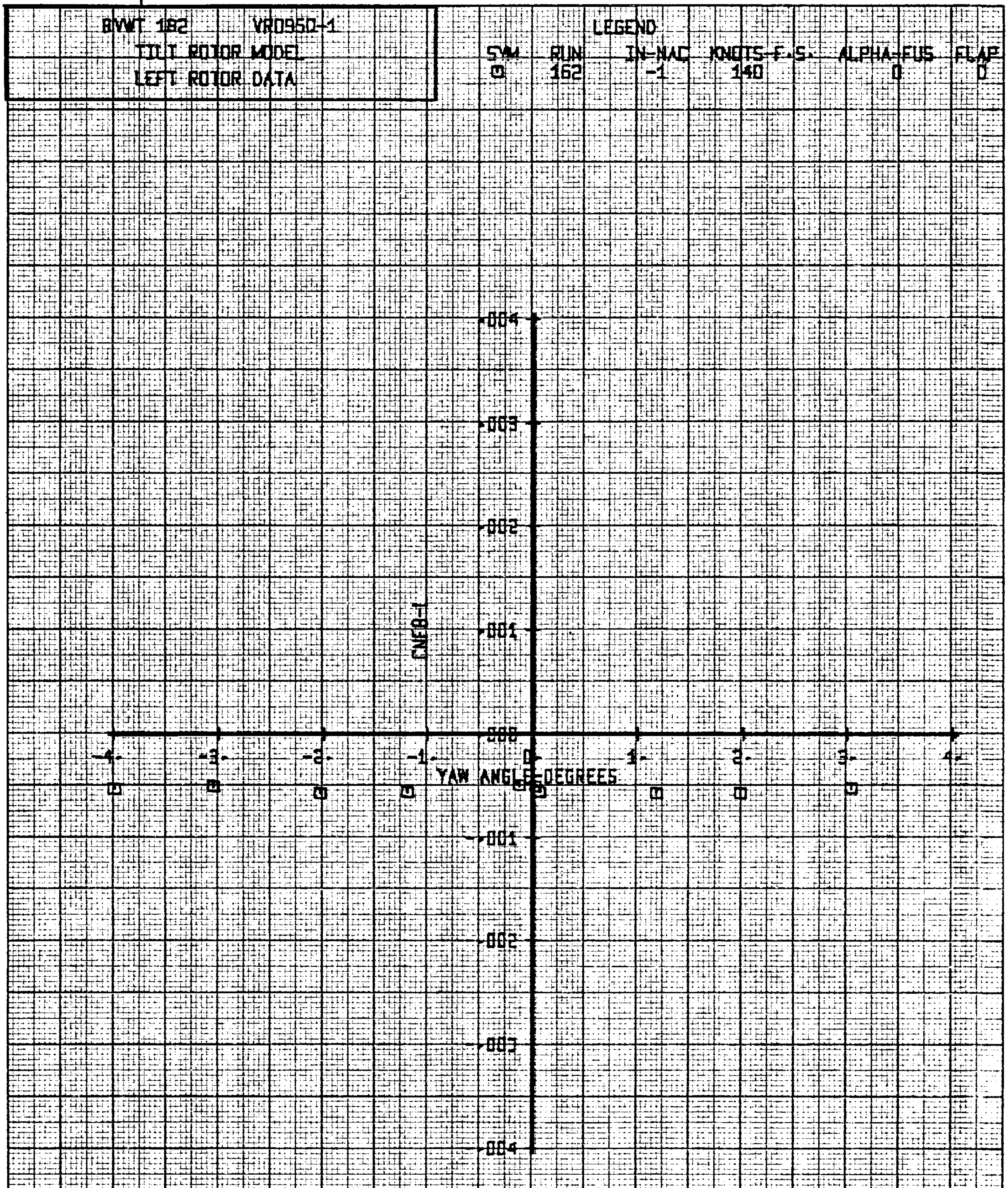

Figure 13-027. Left Rotor Normal Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Air-Speed 140 Knots.

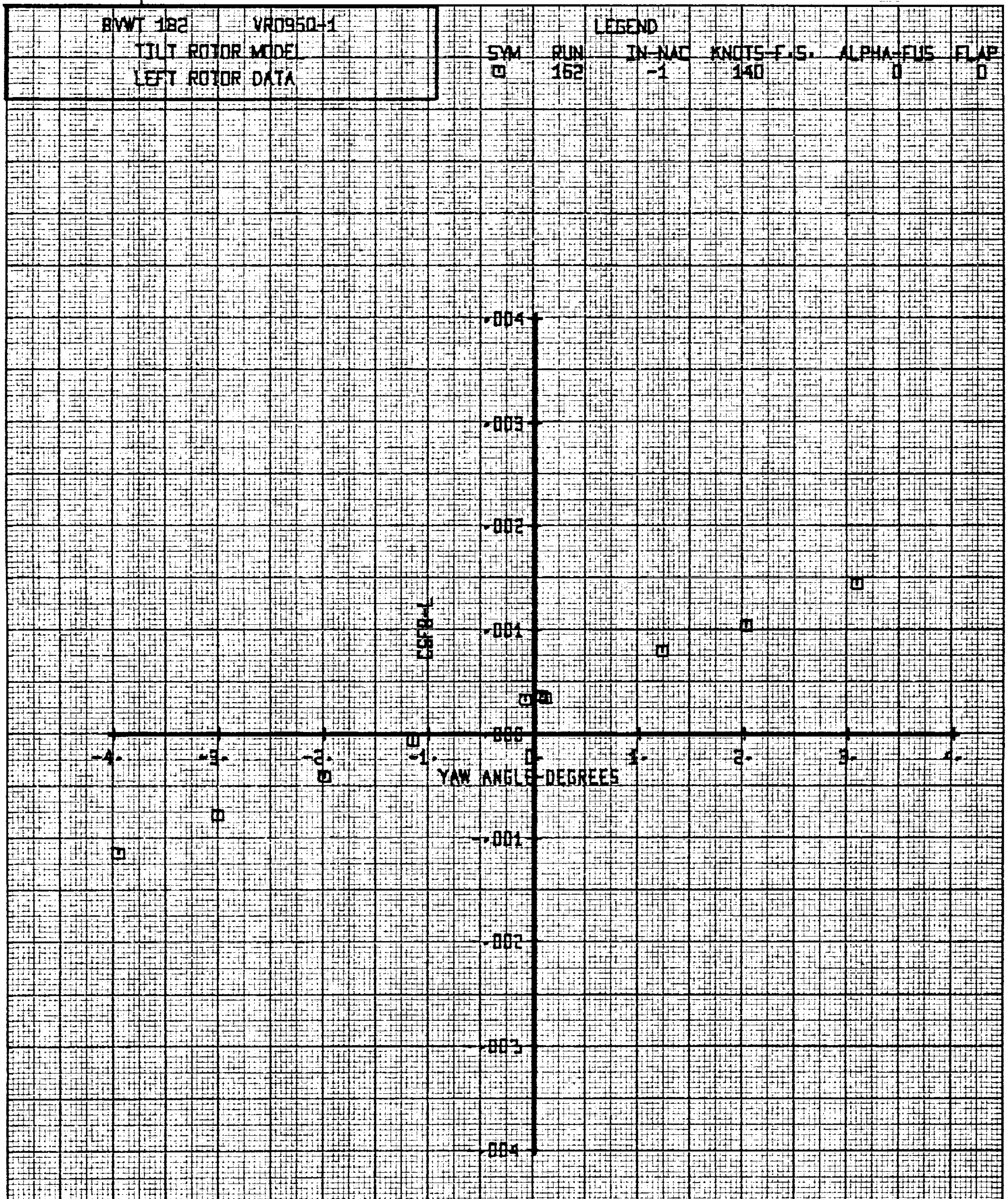

Figure 13-028. Left Rotor Side Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

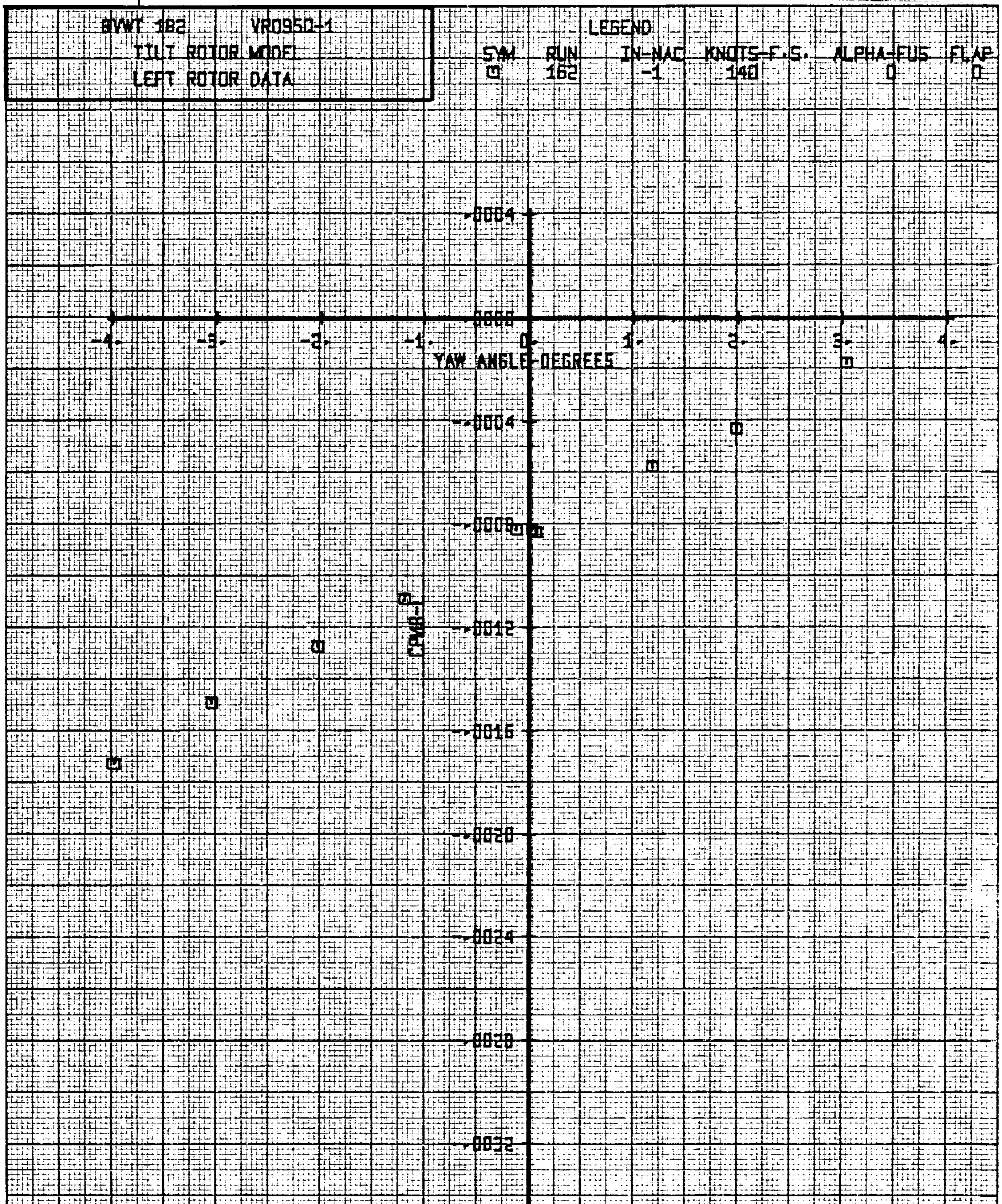

Figure 13-029. Left Rotor Pitching Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

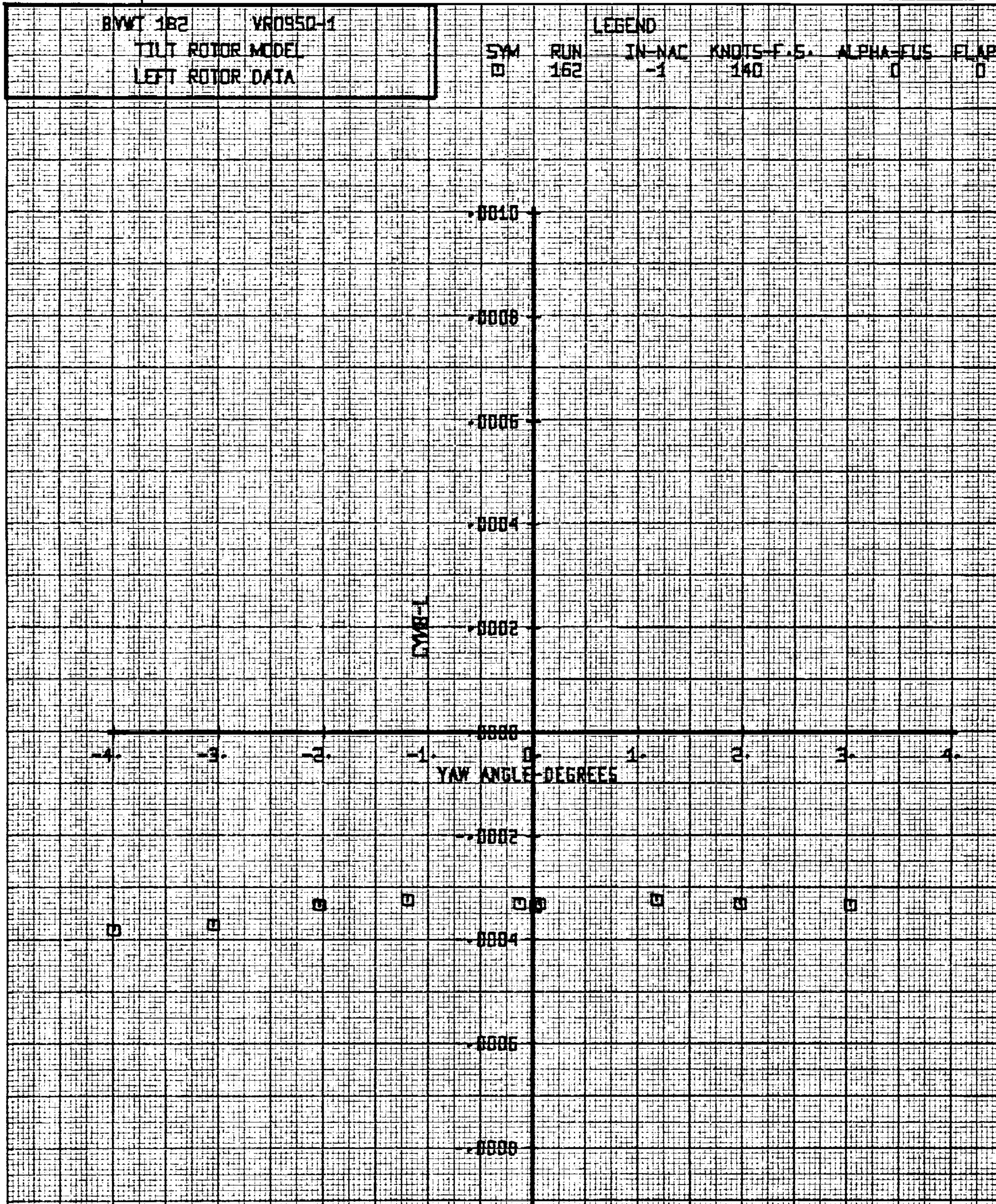

Figure 13-030. Left Rotor Yawing Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

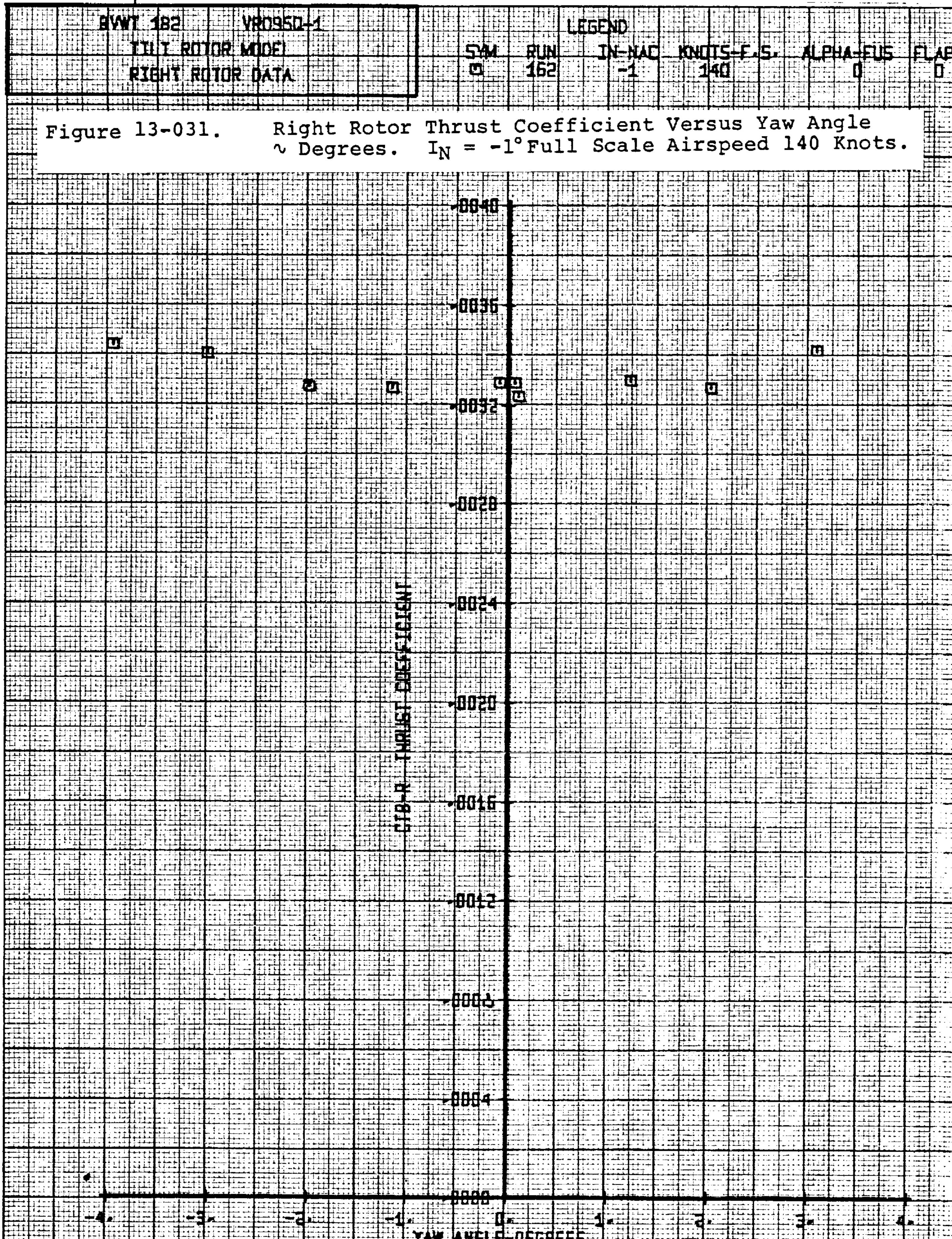

Figure 13-031. Right Rotor Thrust Coefficient Versus Yaw Angle ∿ Degrees. I_N = -1° Full Scale Airspeed 140 Knots.

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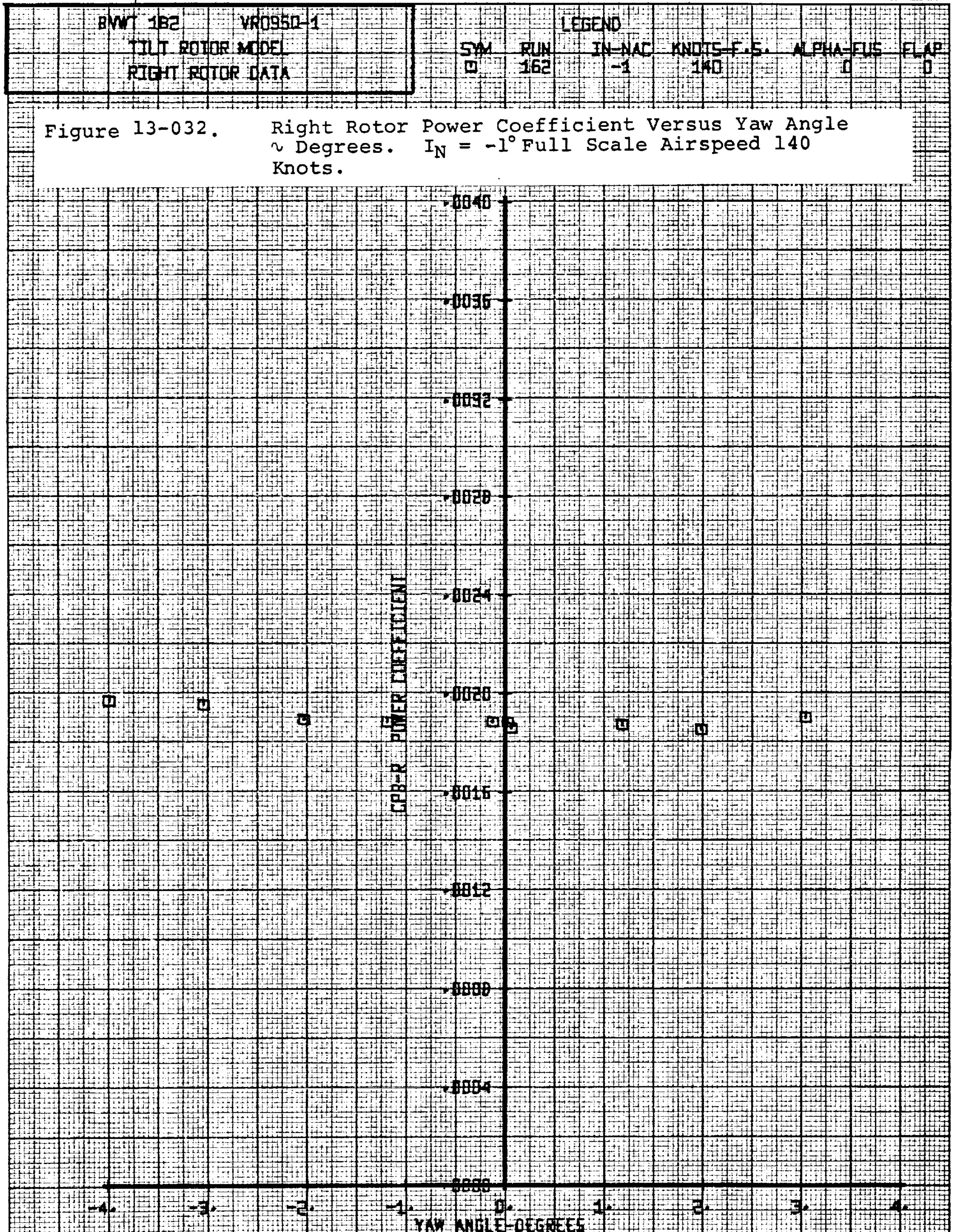
Figure 13-032. Right Rotor Power Coefficient Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.



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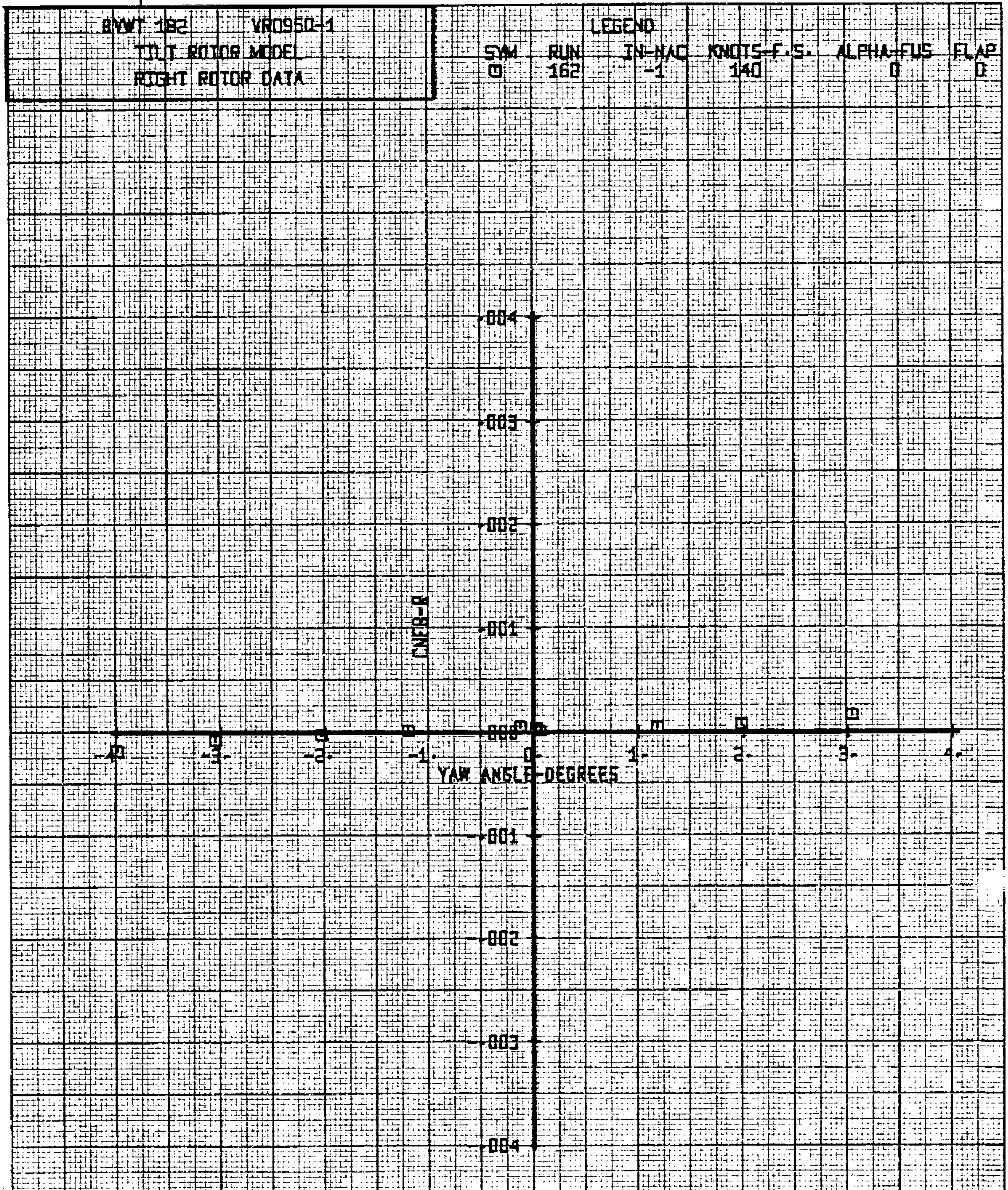

Figure 13-033. Right Rotor Normal Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

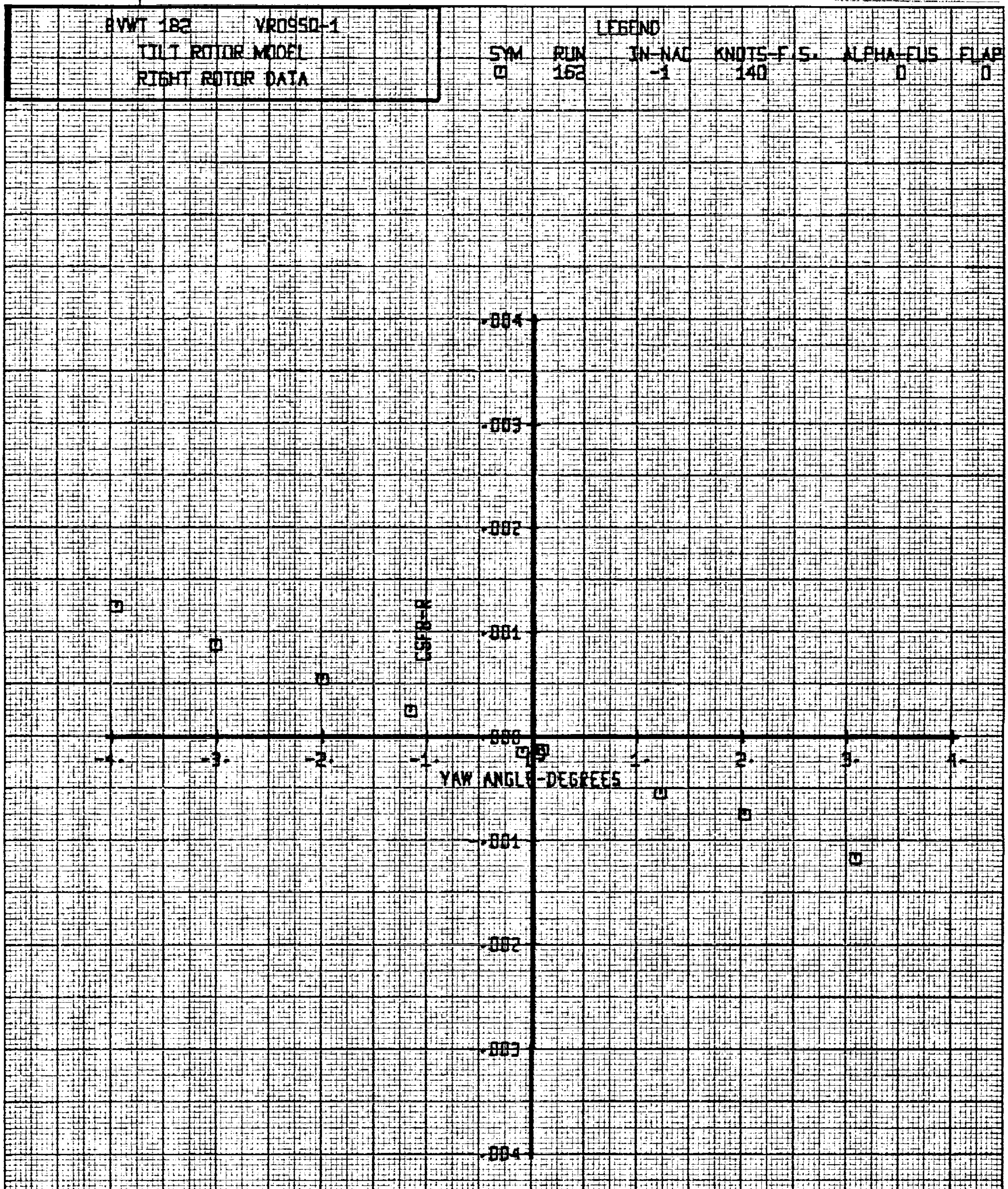

Figure 13-034. Right Rotor Side Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

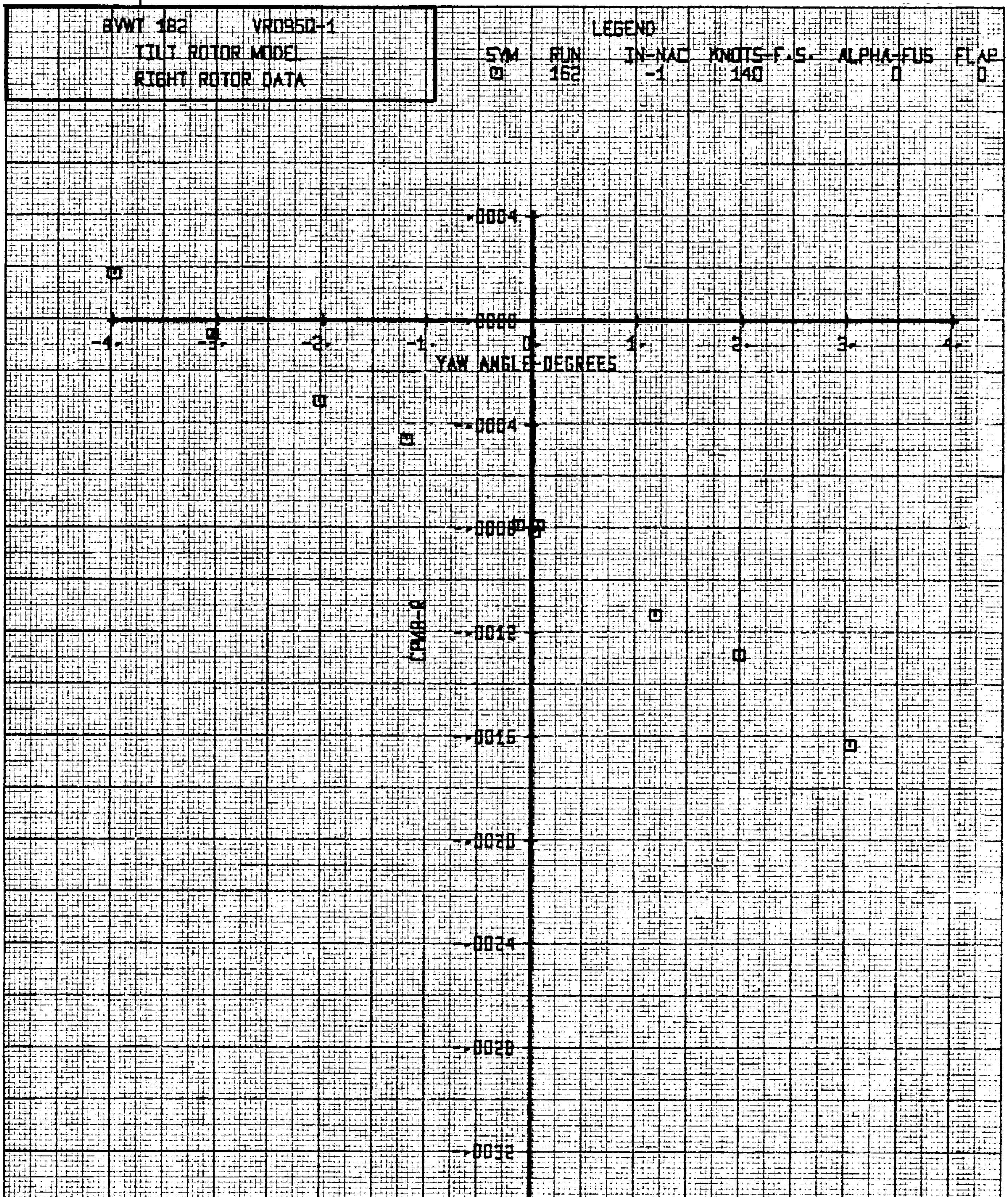

Figure 13-035. Right Rotor Pitching Moment Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 140 Knots.

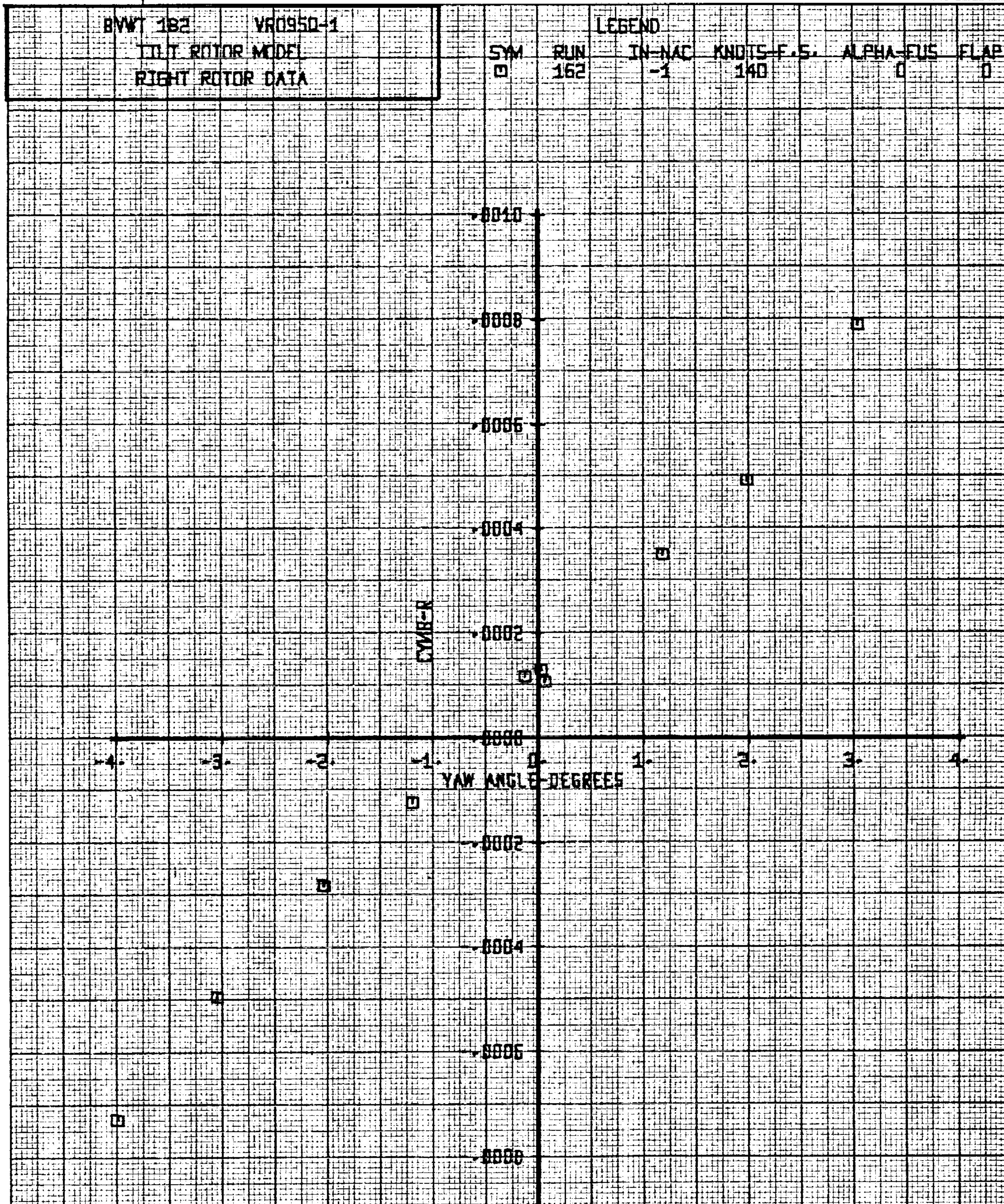

Figure 13-036. Right Rotor Yawing Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

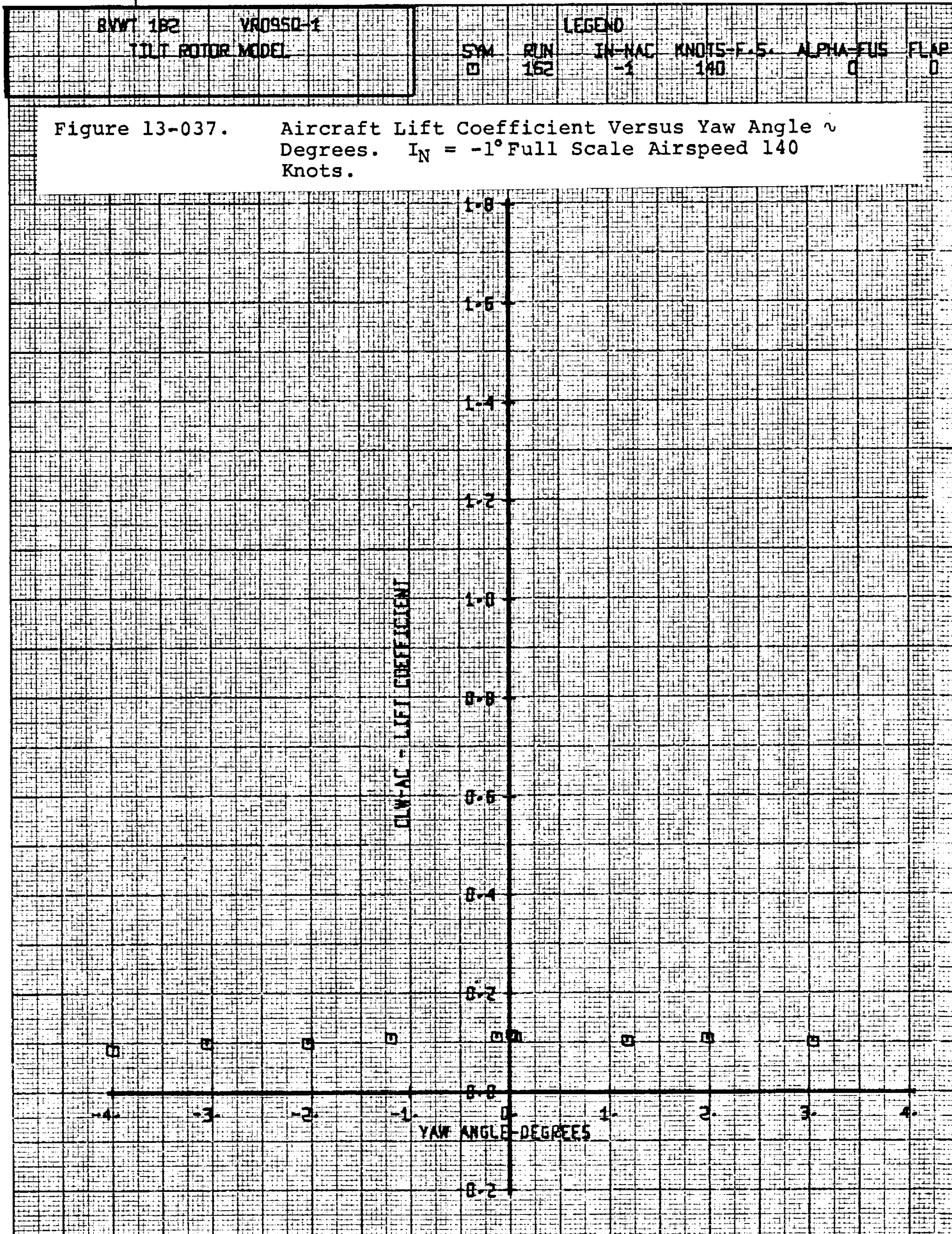

Figure 13-037. Aircraft Lift Coefficient Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 140 Knots.

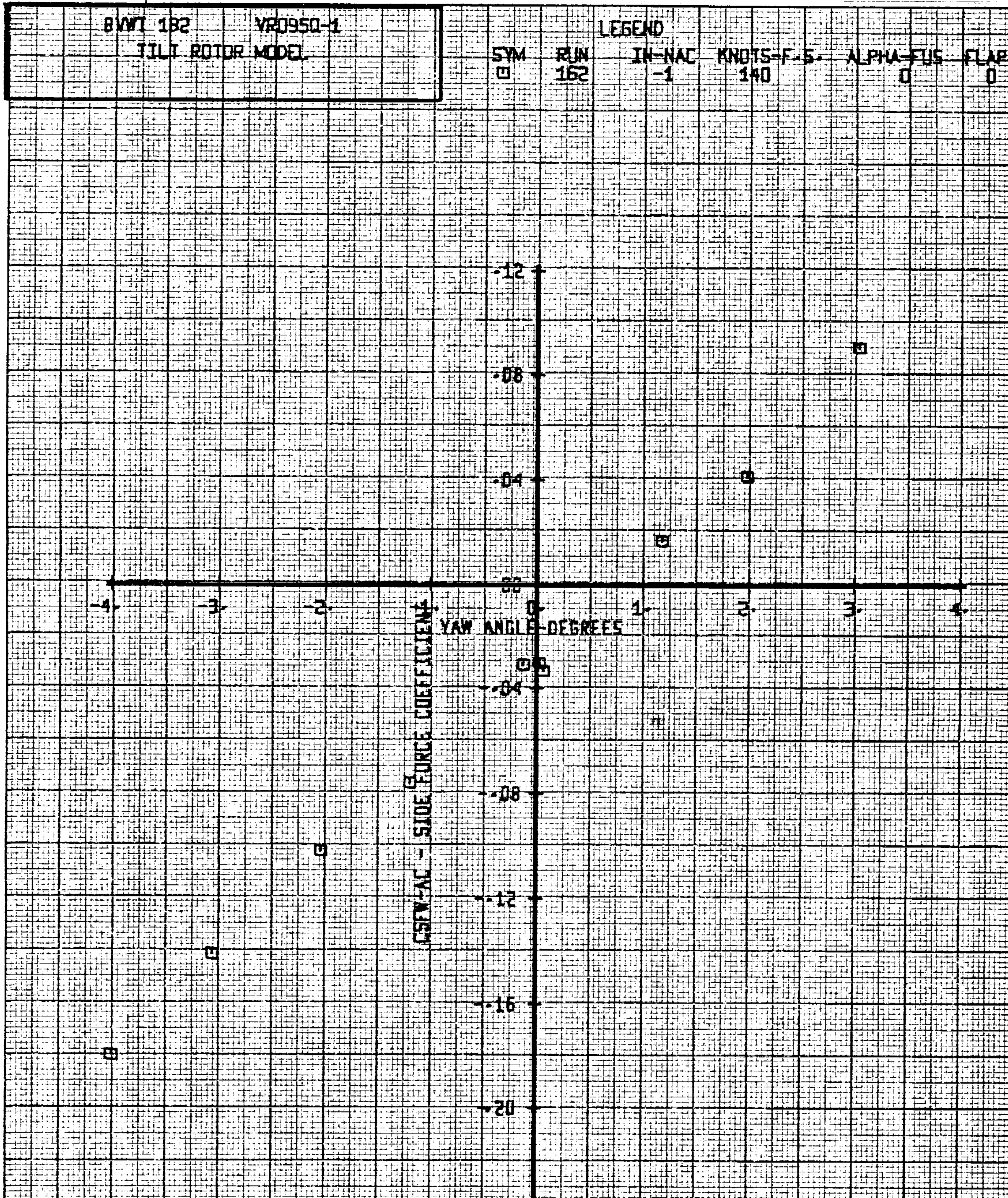

Figure 13-038. Aircraft Side Force Coefficient Versus Yaw ~ Angle Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

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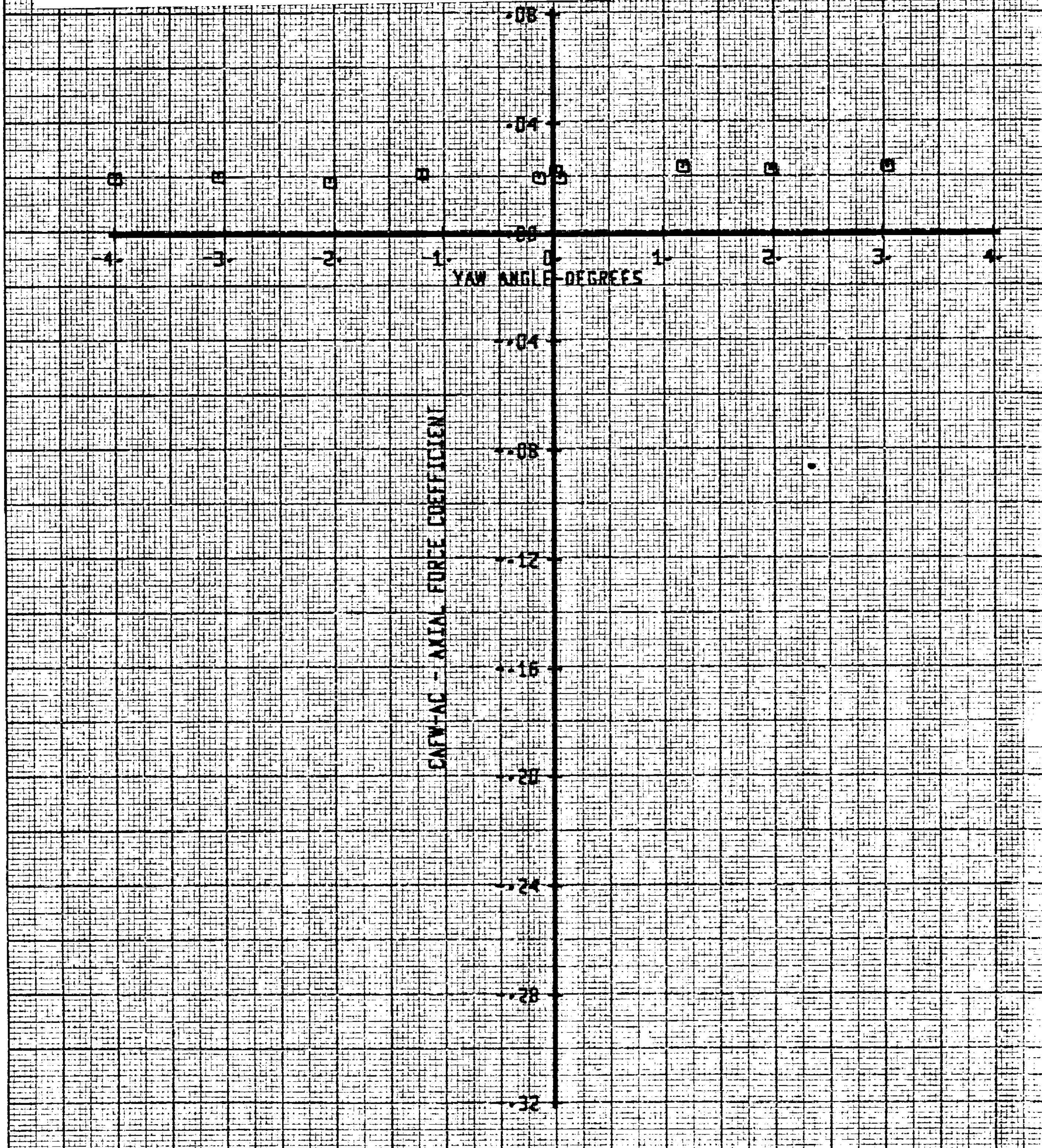
TILT ROTOR MODEL

LEGEND

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	162	-1	140	0	0

Figure 13-039. Aircraft Axial Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.



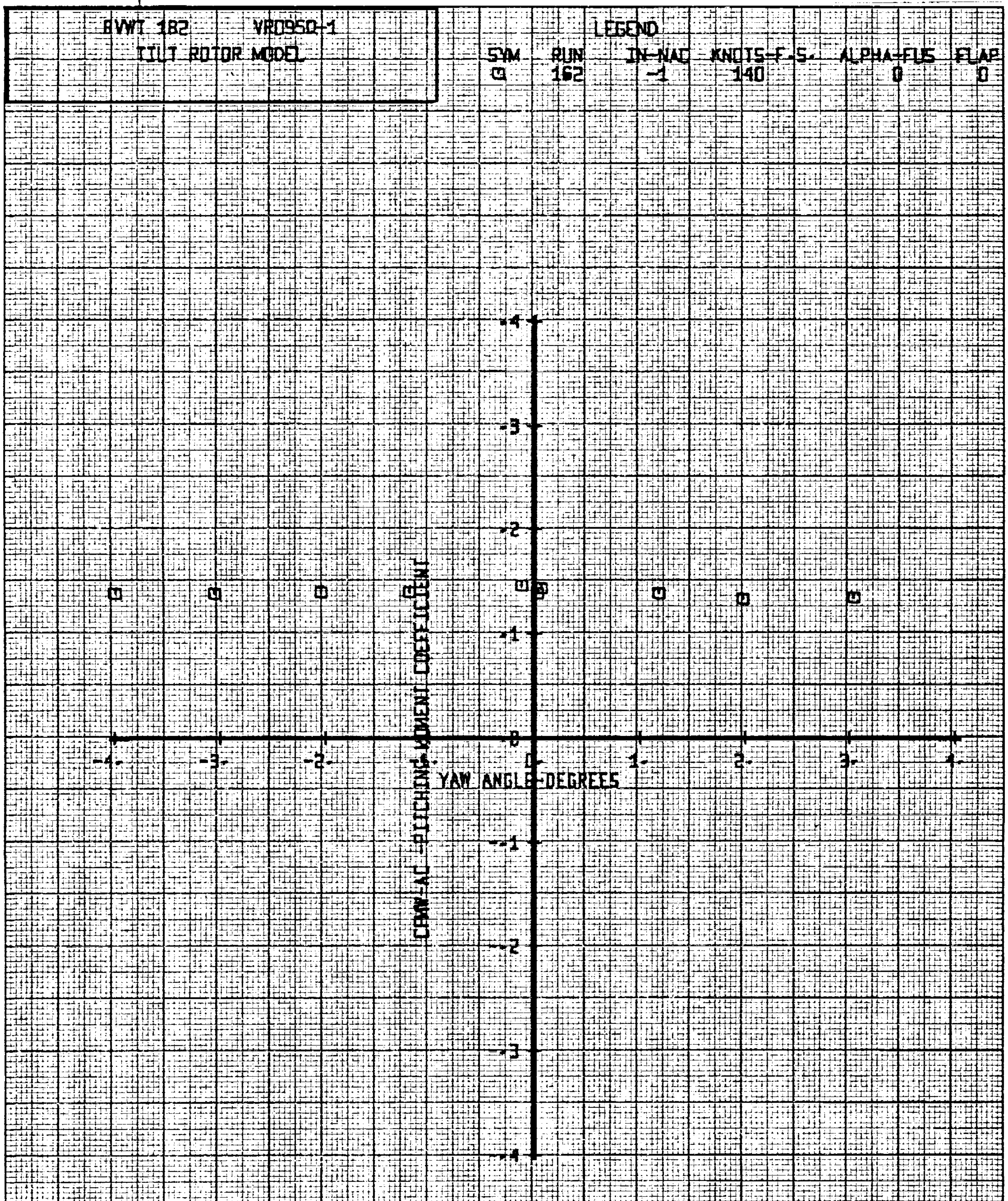


Figure 13-040. Aircraft Pitching Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

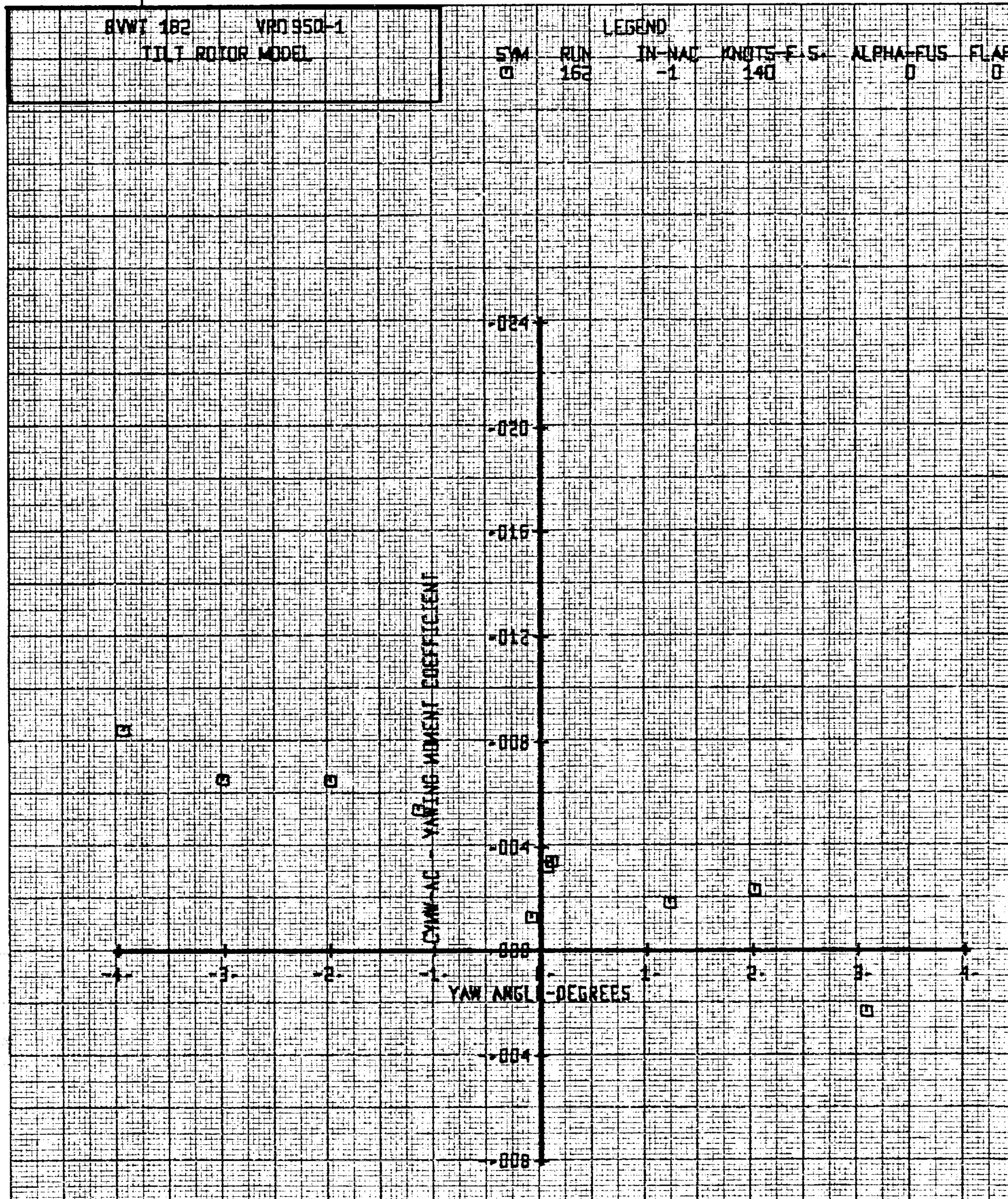


Figure 13-041. Aircraft Yawing Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

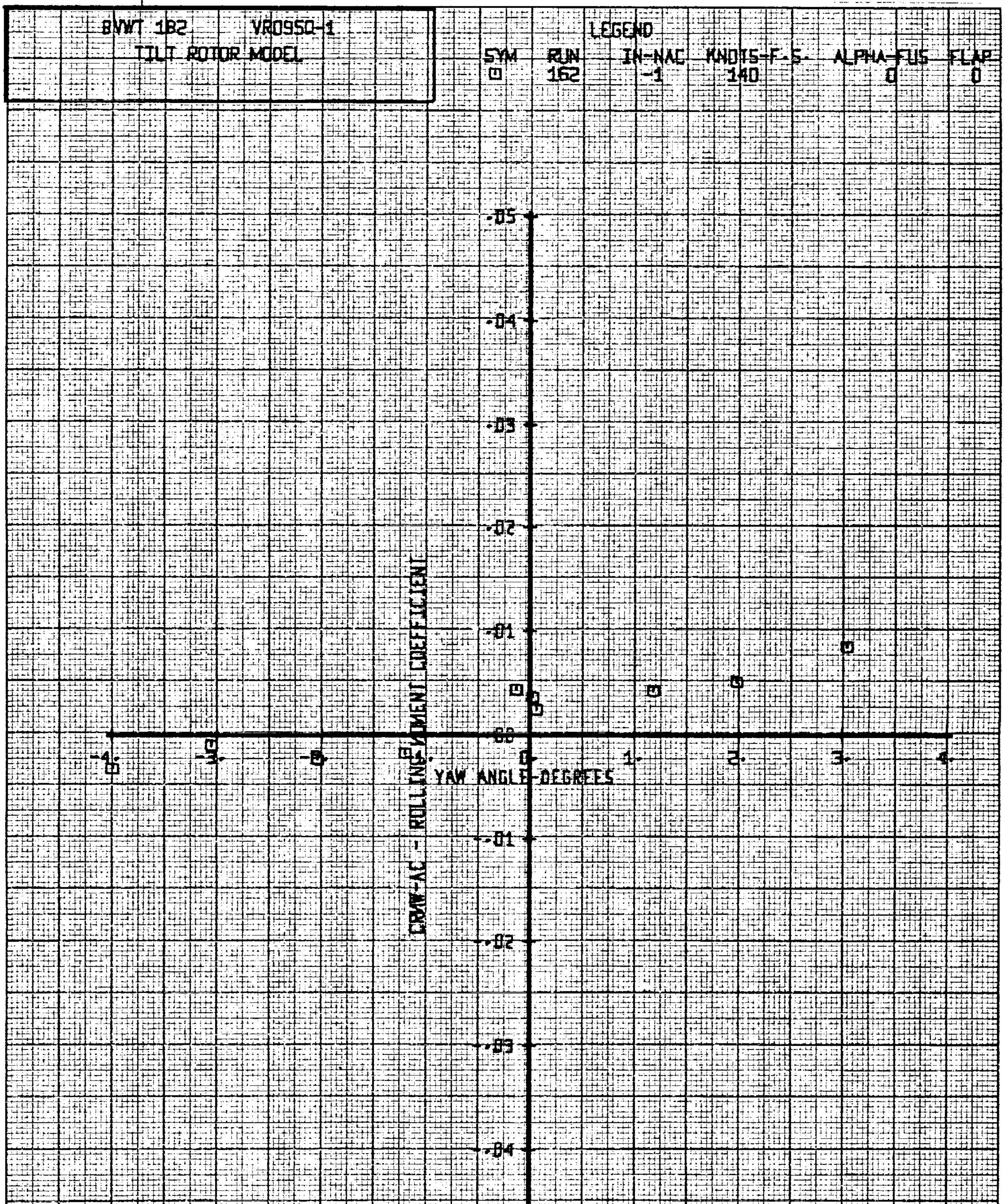


Figure 13-042. Aircraft Rolling Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

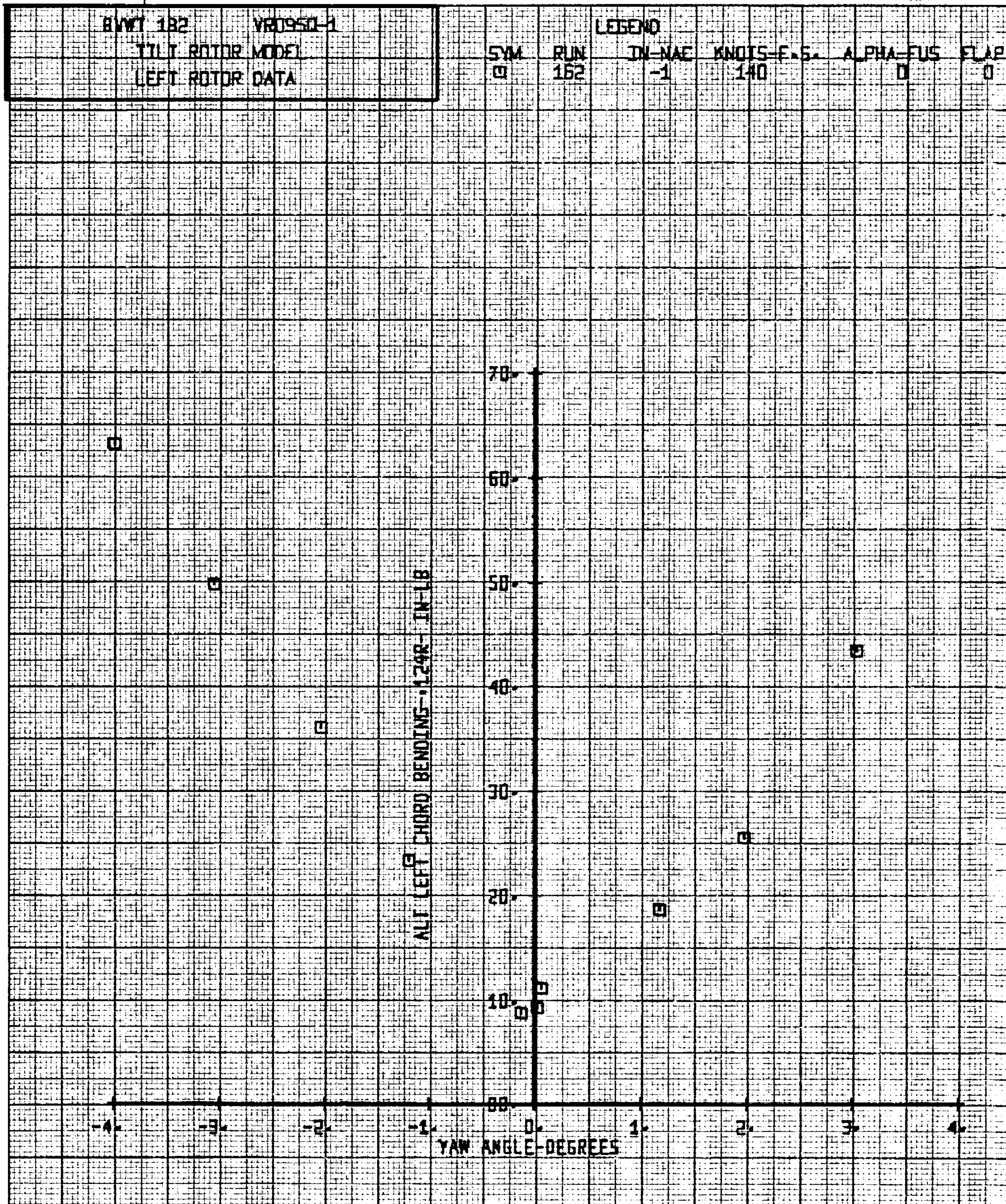


Figure 13-043. Alt. Left Chord Bending Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

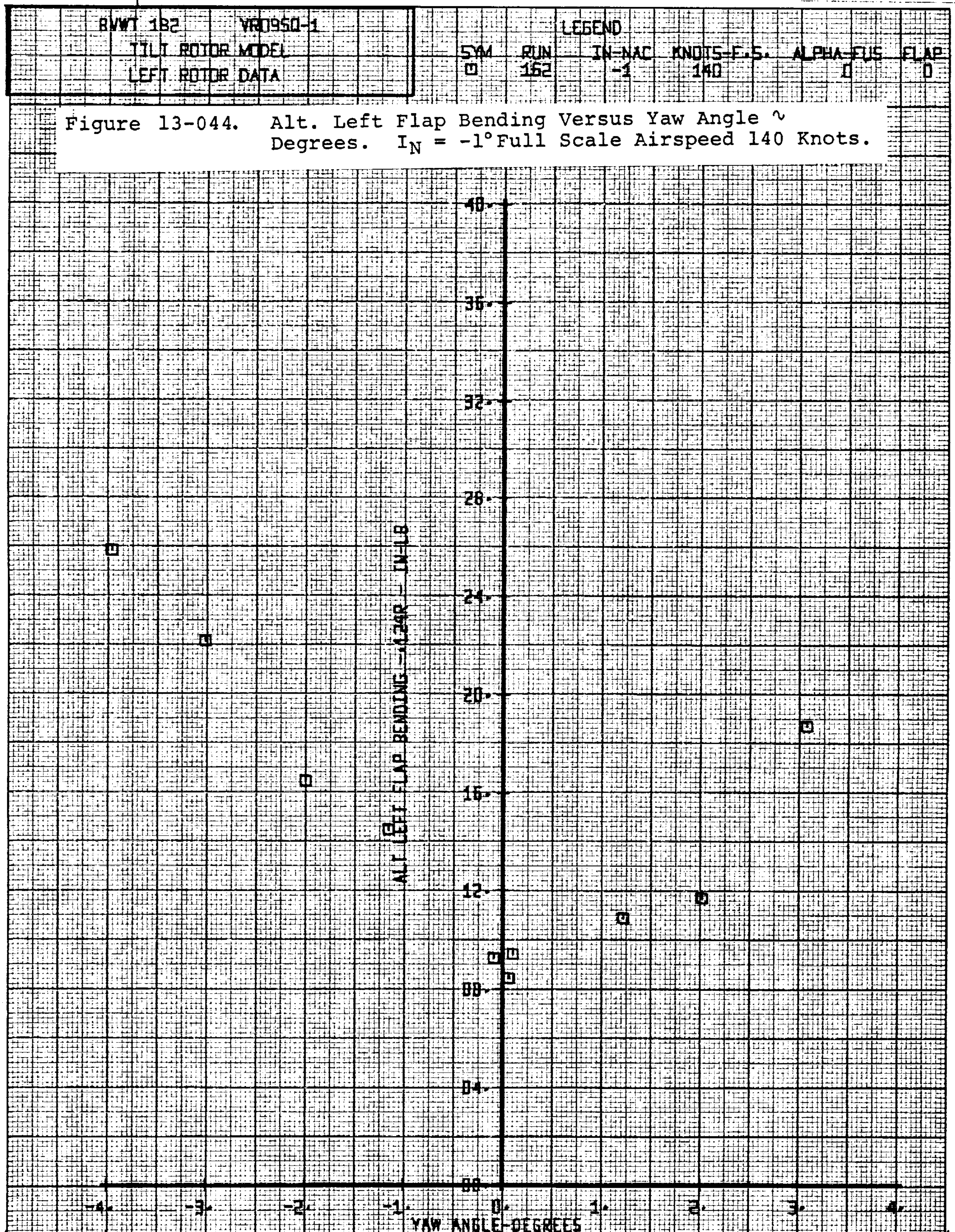


Figure 13-044. Alt. Left Flap Bending Versus Yaw Angle ∿ Degrees. I_N = -1°Full Scale Airspeed 140 Knots.

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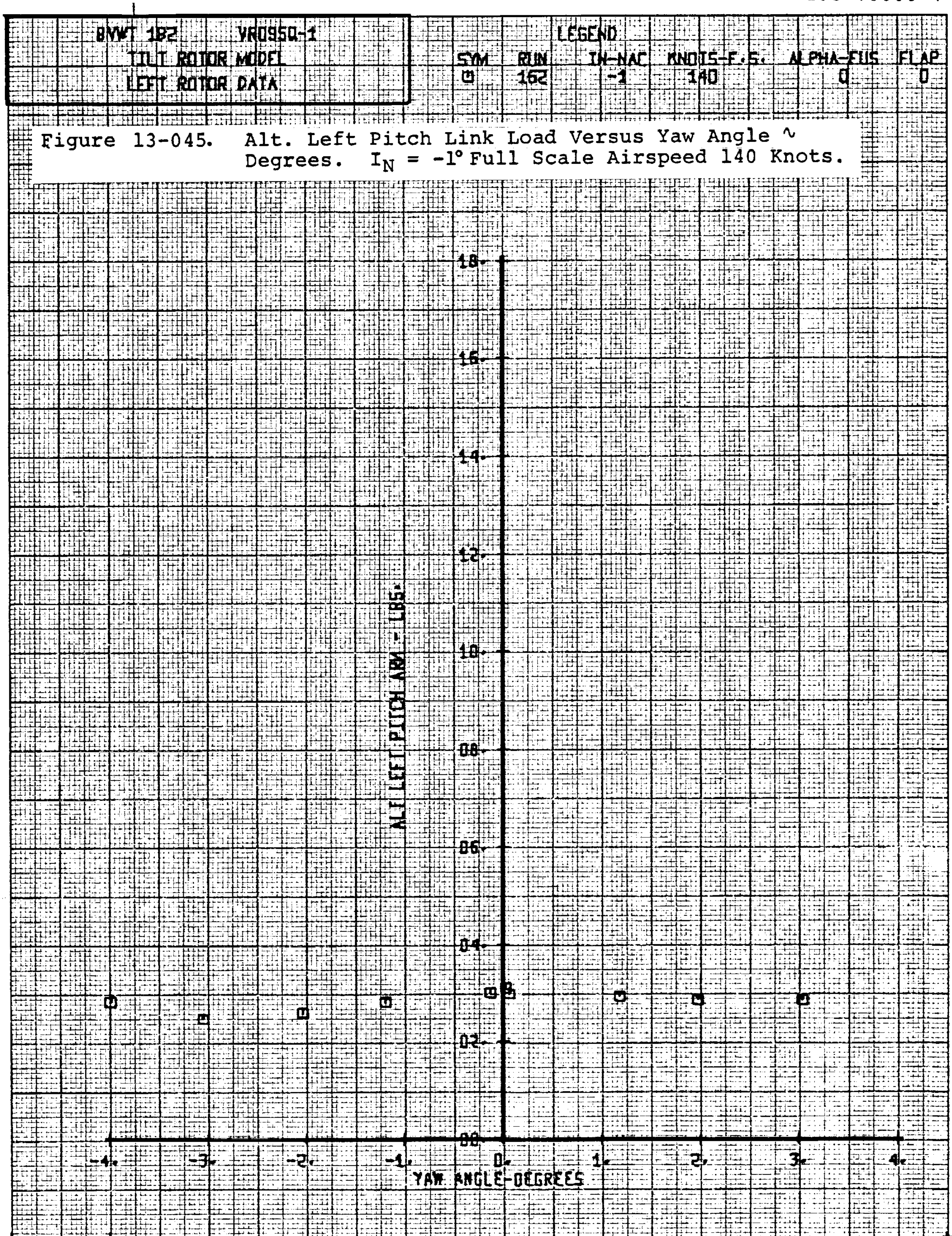
Figure 13-045. Alt. Left Pitch Link Load Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.



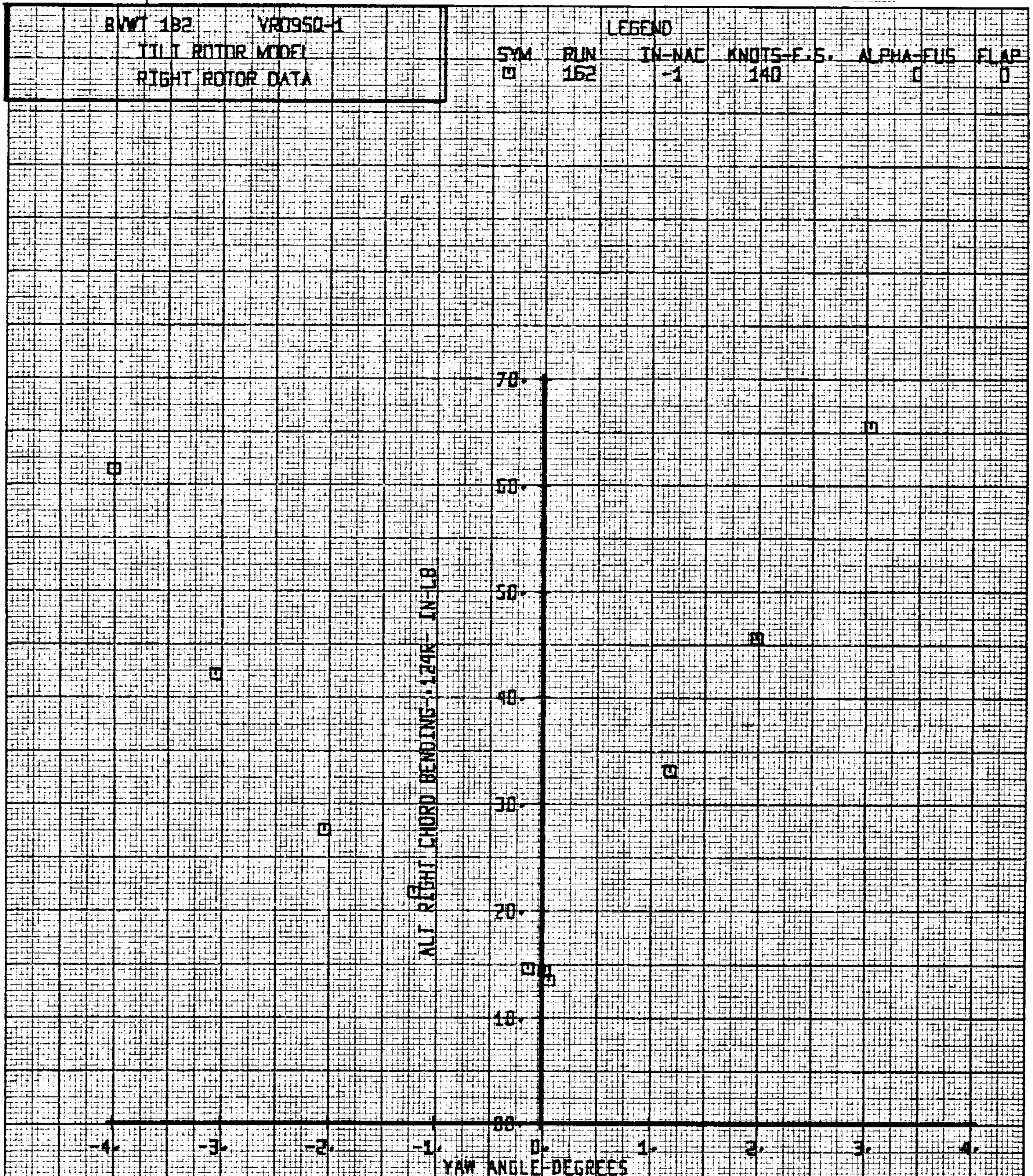
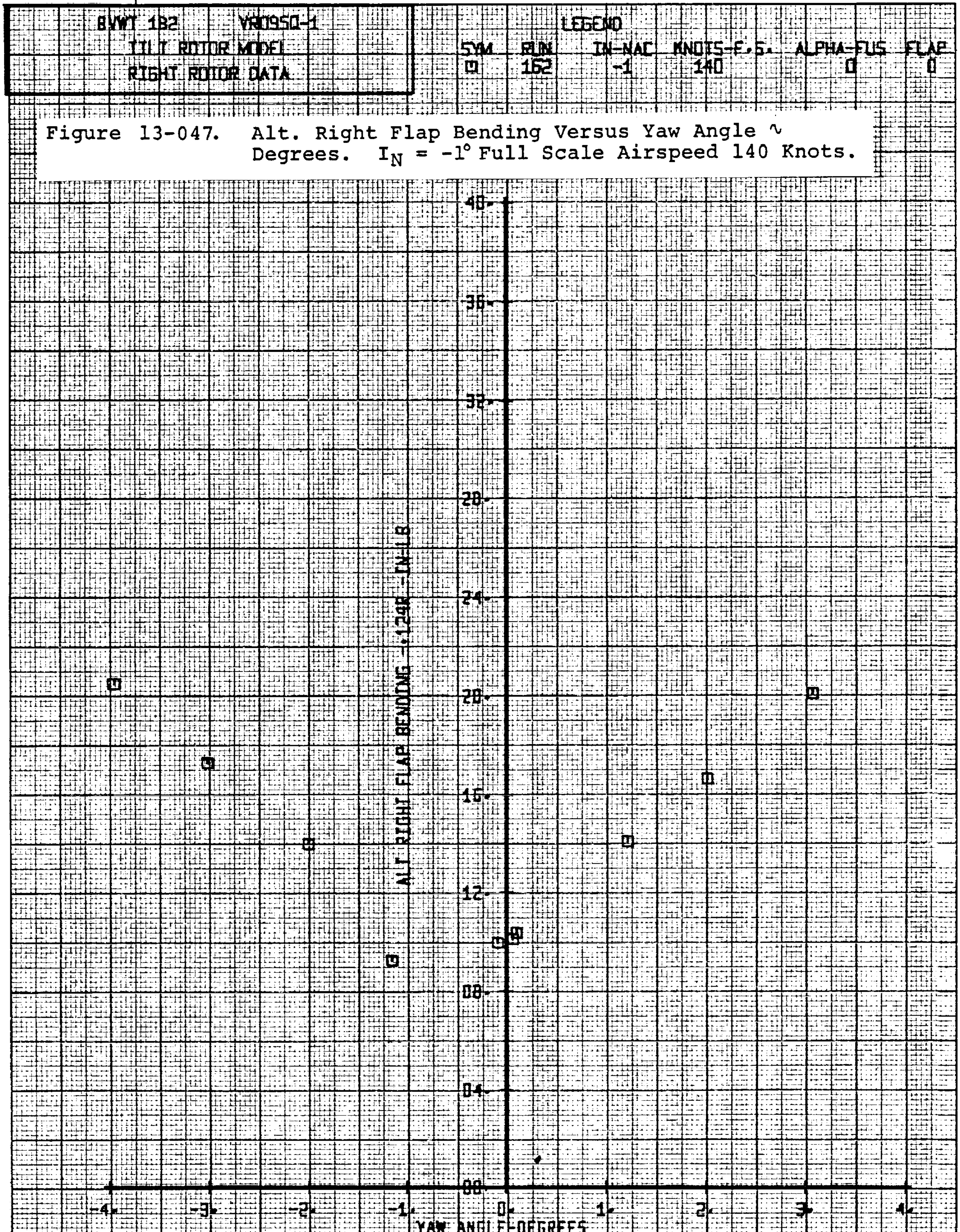


Figure 13-046. Alt. Right Chord Bending Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

Figure 13-047. Alt. Right Flap Bending Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.



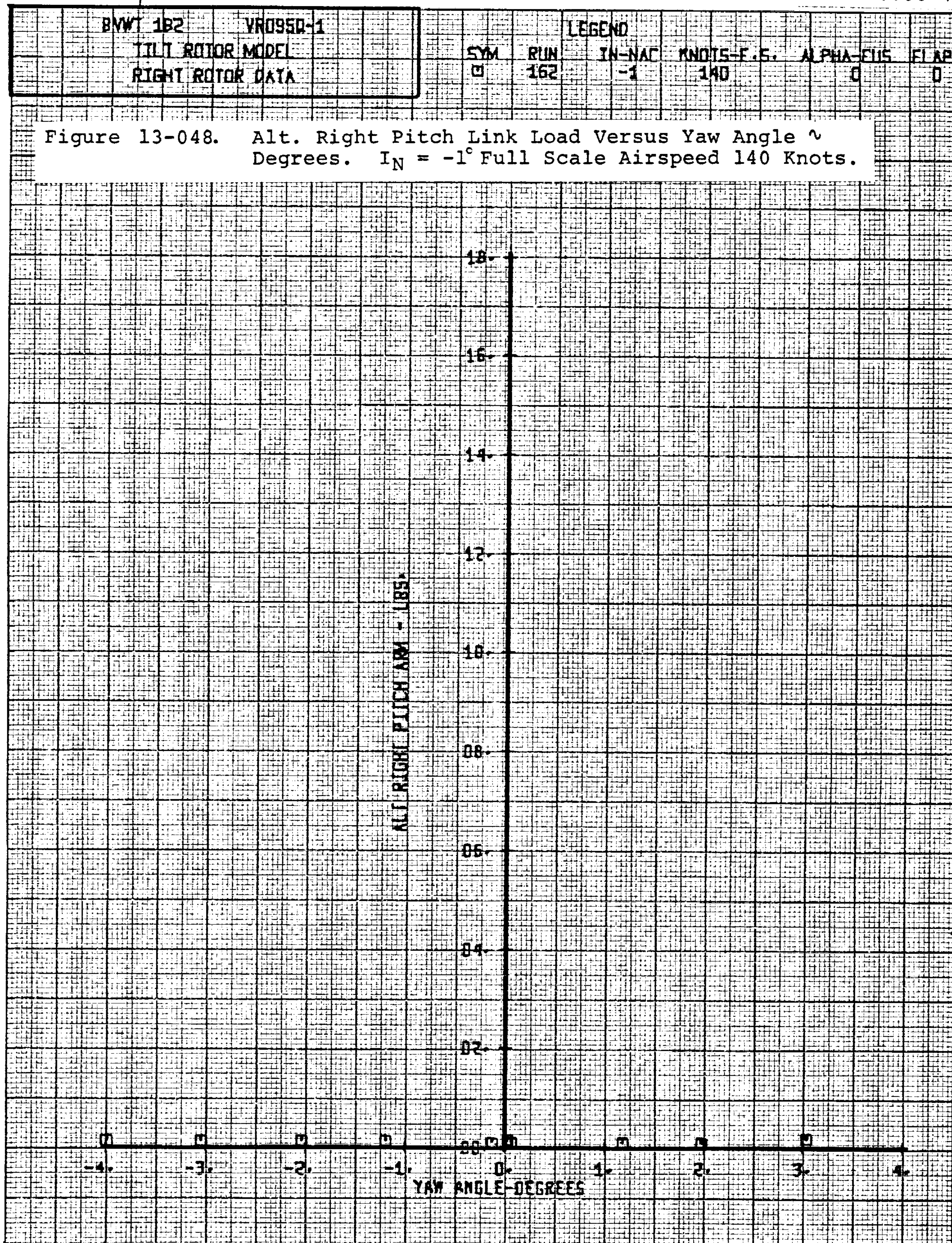


Figure 13-048. Alt. Right Pitch Link Load Versus Yaw Angle ~ Degrees. $I_N = -1^{\circ}$ Full Scale Airspeed 140 Knots.

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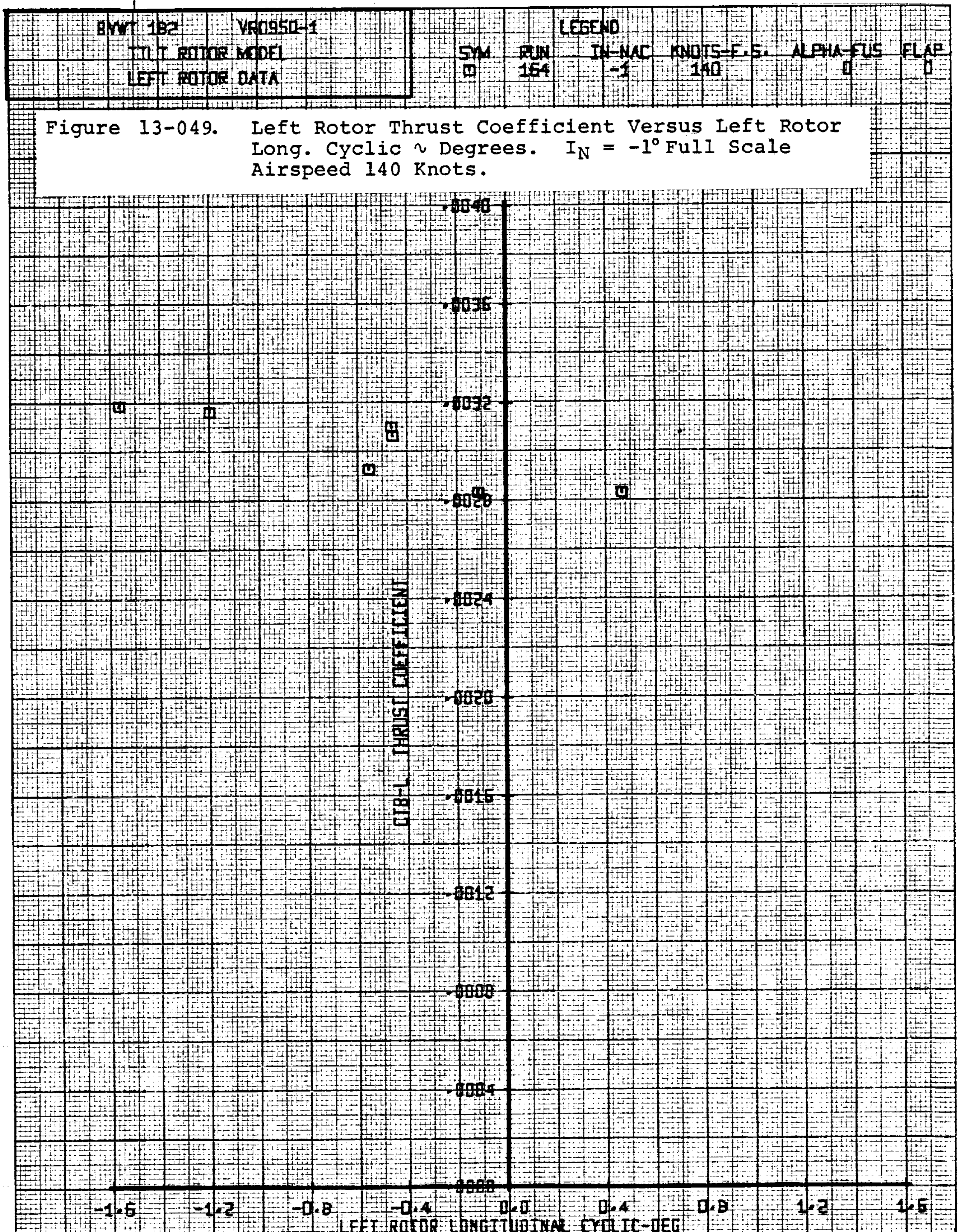

Figure 13-049. Left Rotor Thrust Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

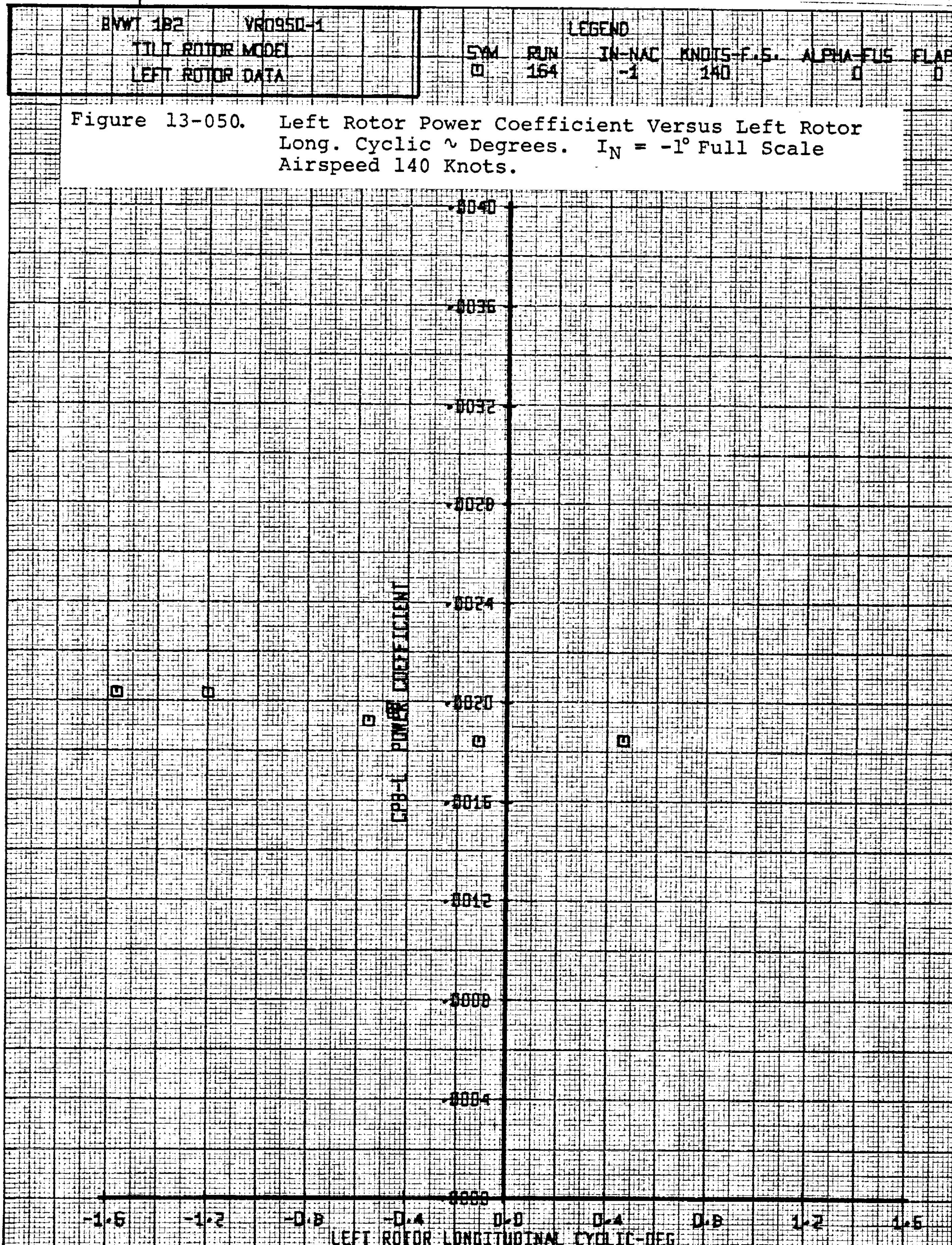

Figure 13-050. Left Rotor Power Coefficient Versus Left Rotor Long. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

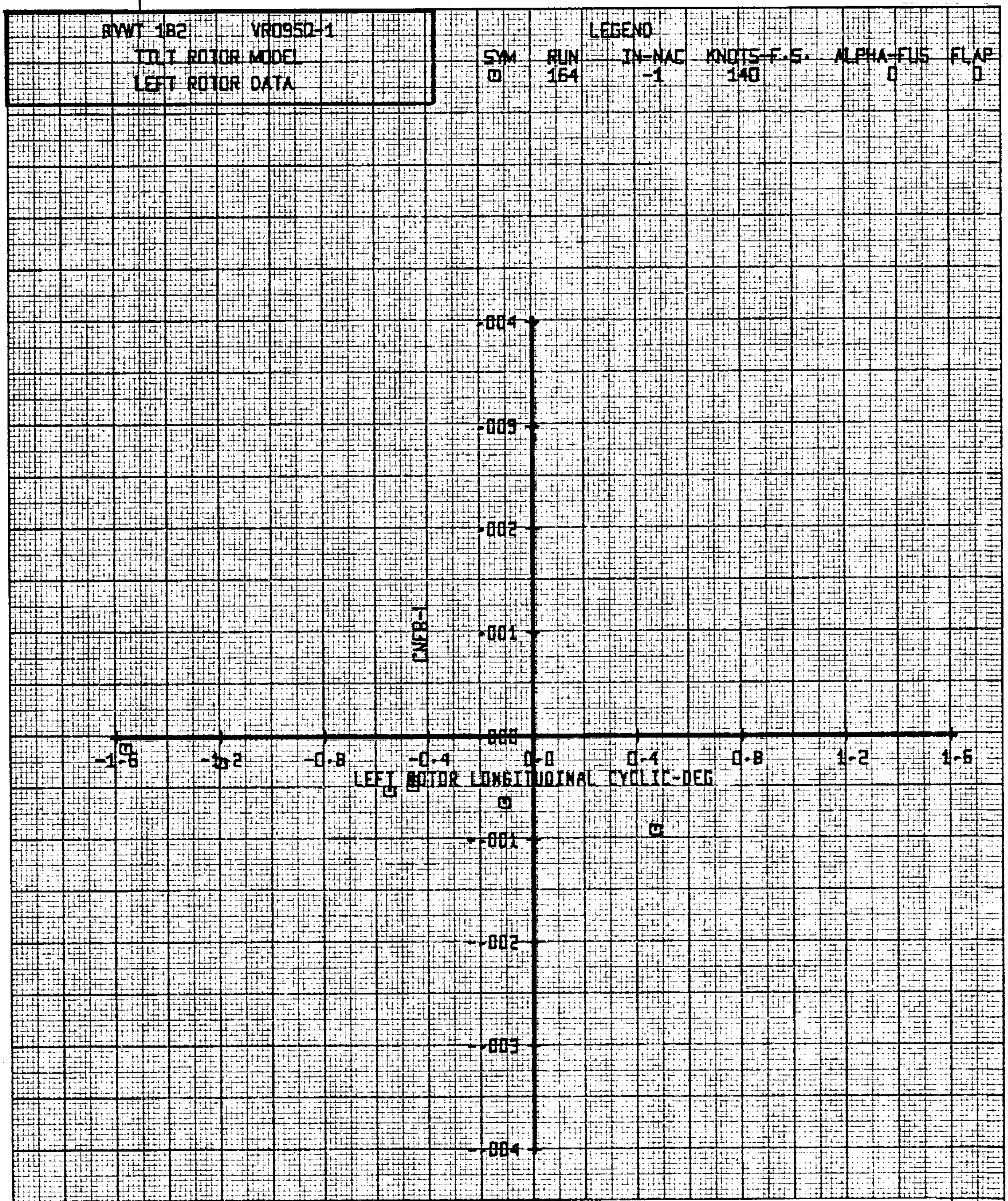

Figure 13-05L. Left Rotor Normal Force Coefficient Versus Left Rotor Long. Cyclic ~ Degrees. I_N = -1° Full Scale Airspeed 140 Knots.

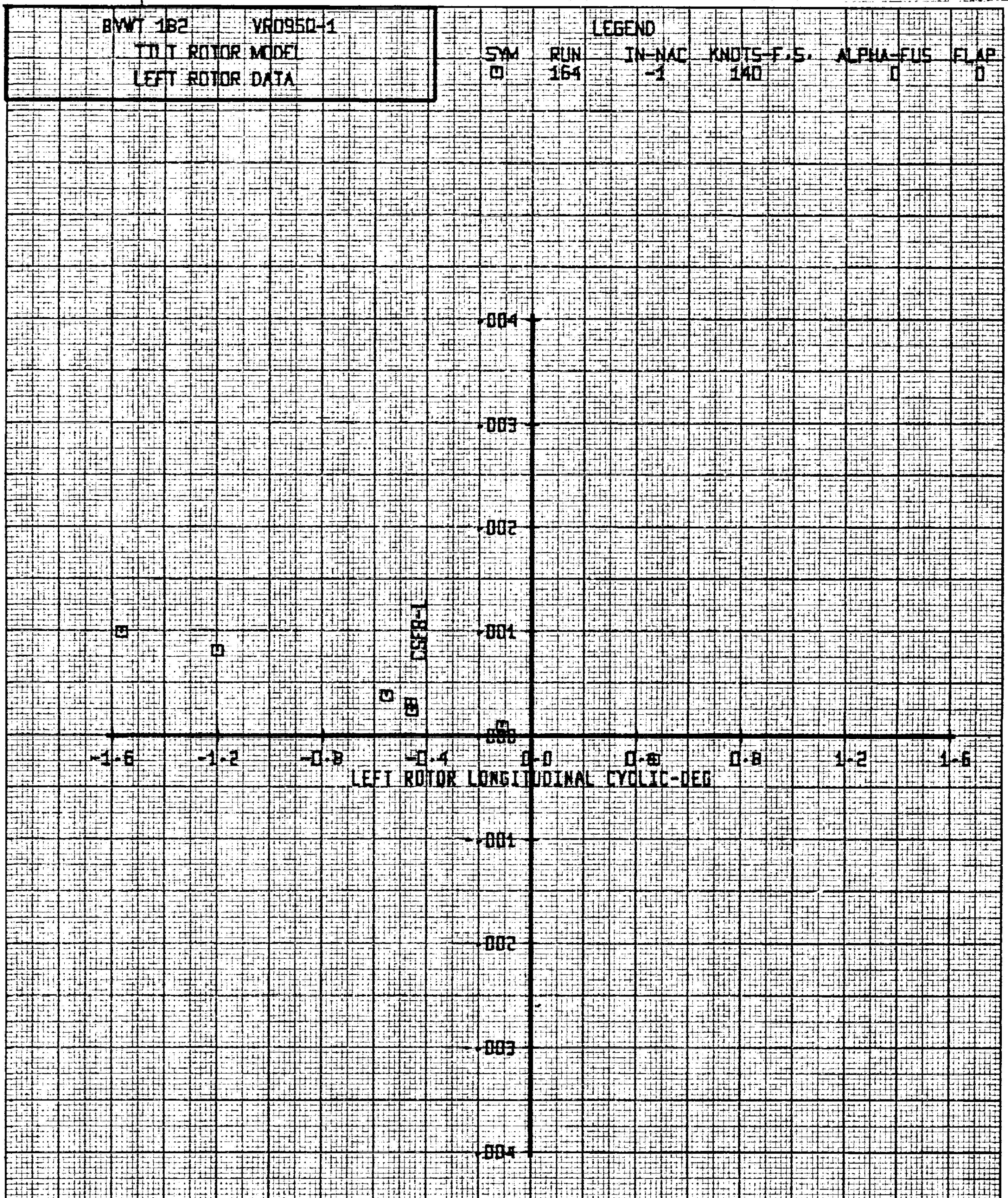

Figure 13-052. Left Rotor Side Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1^\circ$ Full Scale Airspeed 140 Knots.

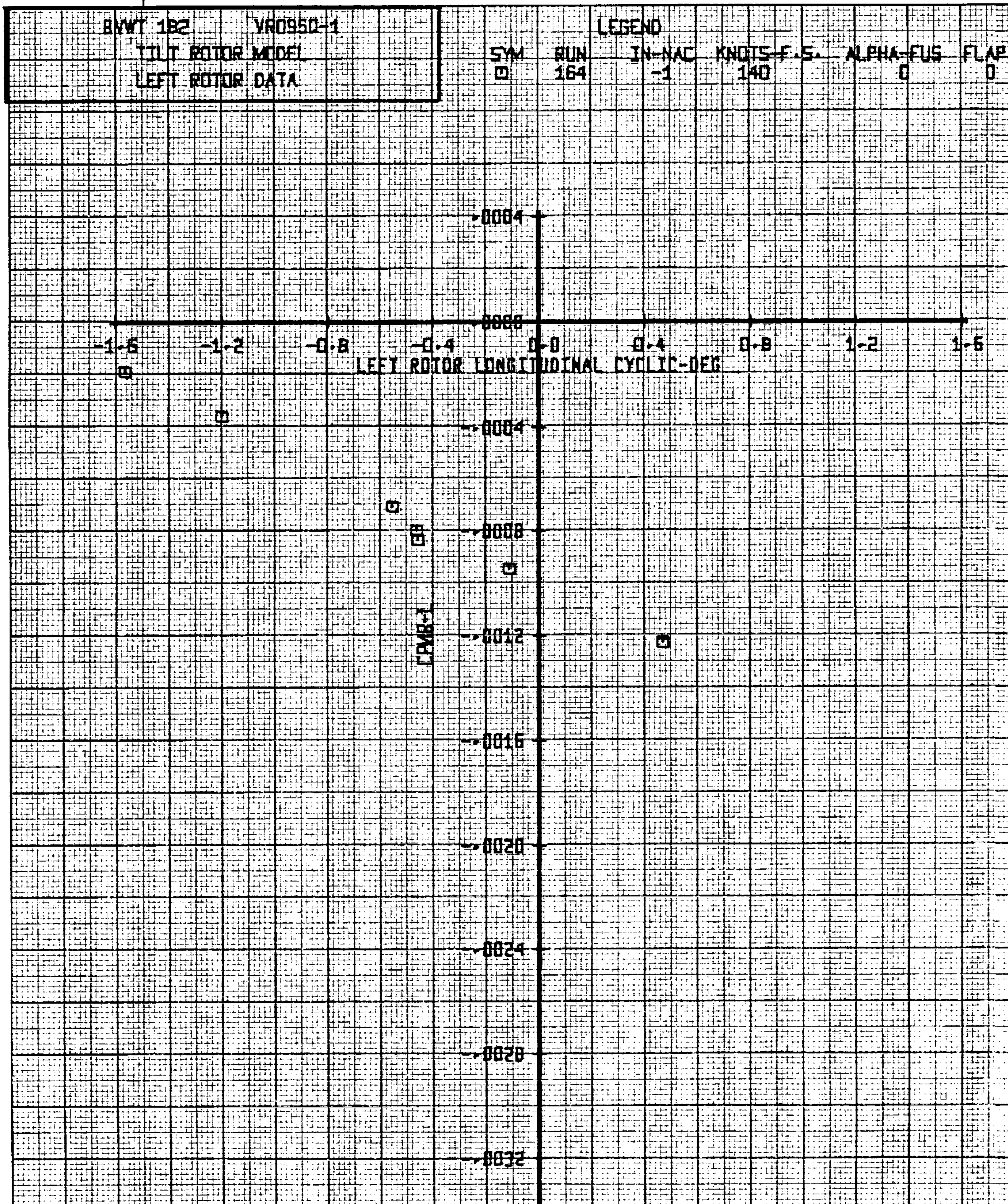

Figure 13-053. Left Rotor Pitching Moment Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

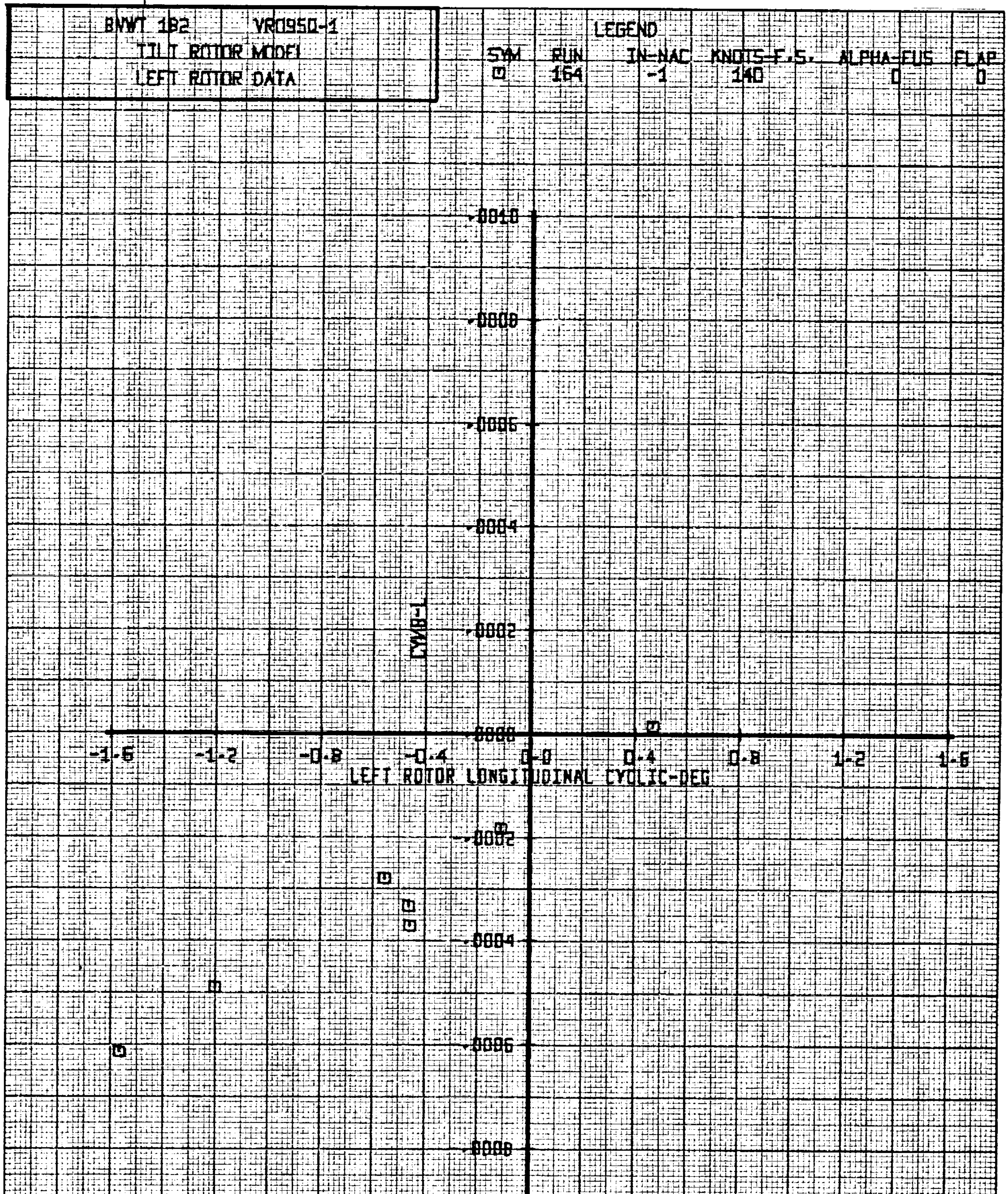

Figure 13-054. Left Rotor Yawing Moment Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

Figure 13-055. Right Rotor Thrust Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

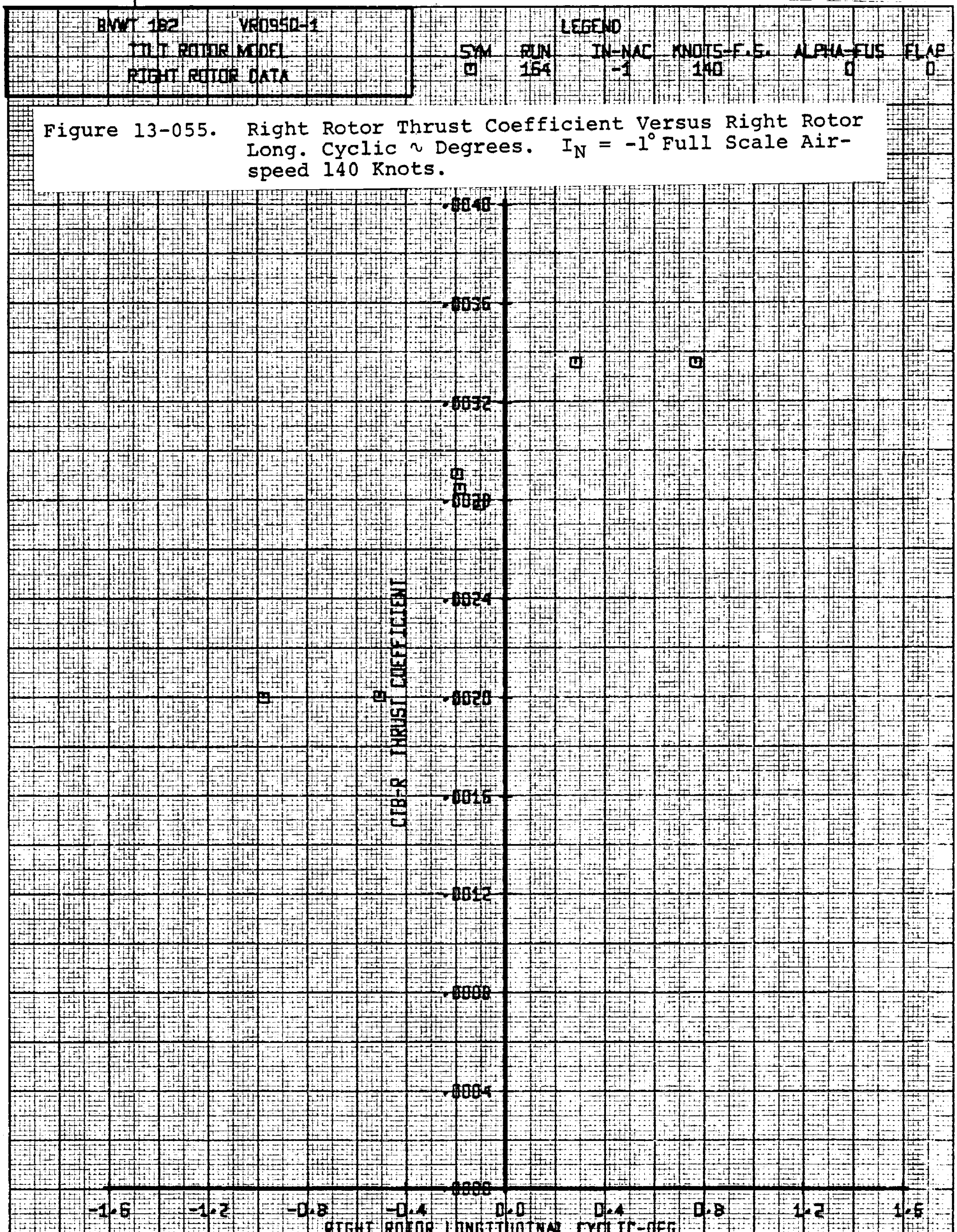

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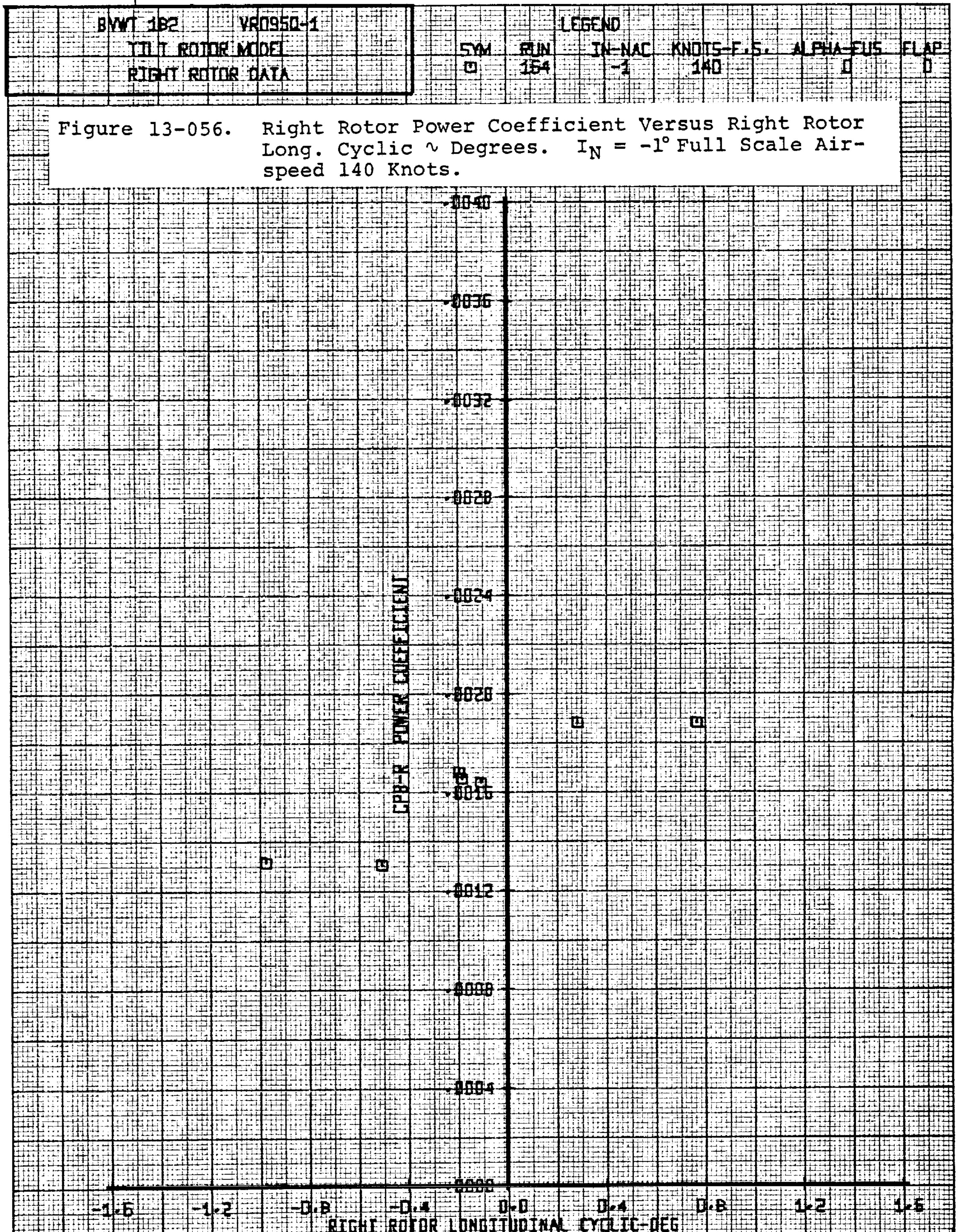
Figure 13-056. Right Rotor Power Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.



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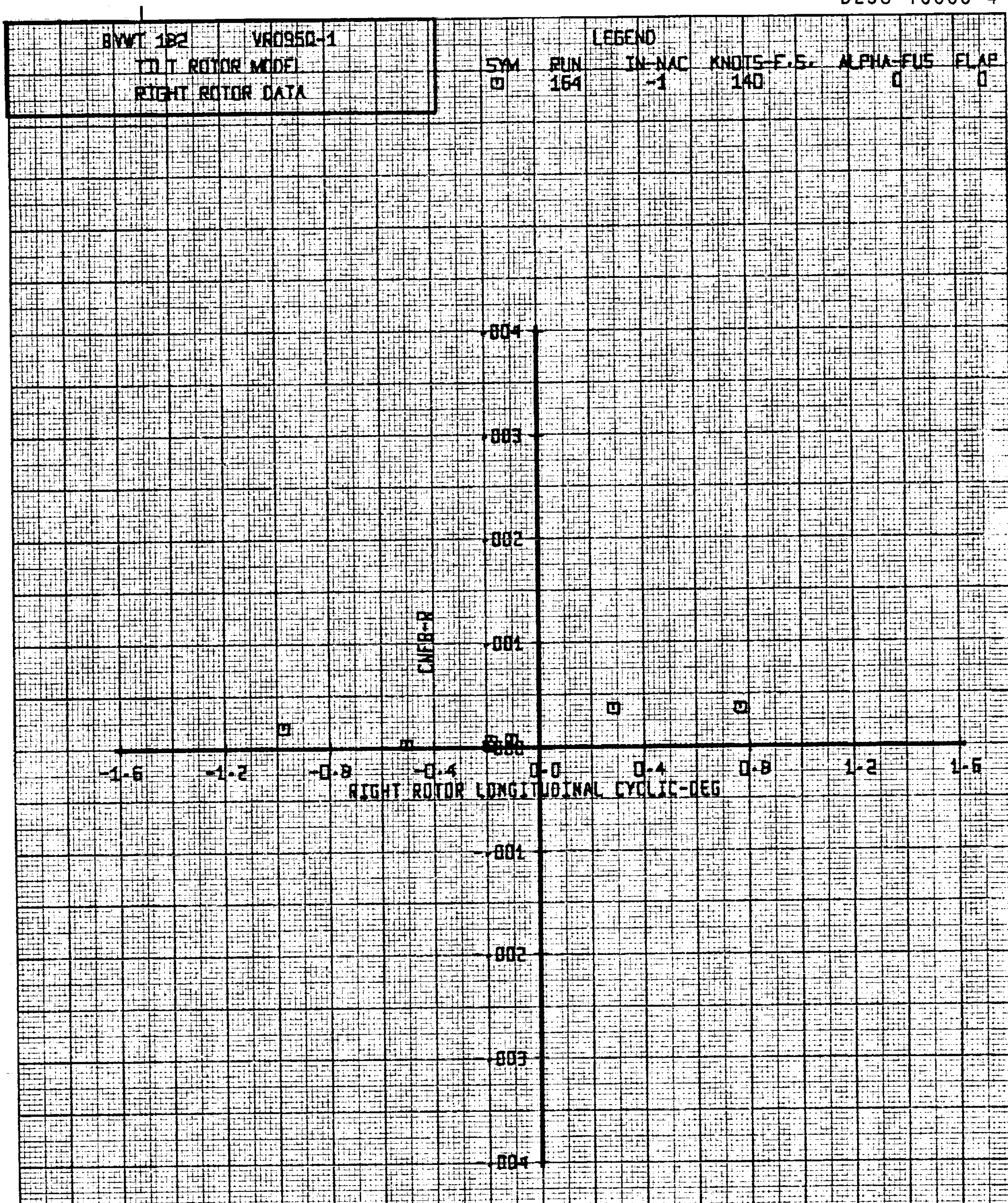


Figure 13-057. Right Rotor Normal Force Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

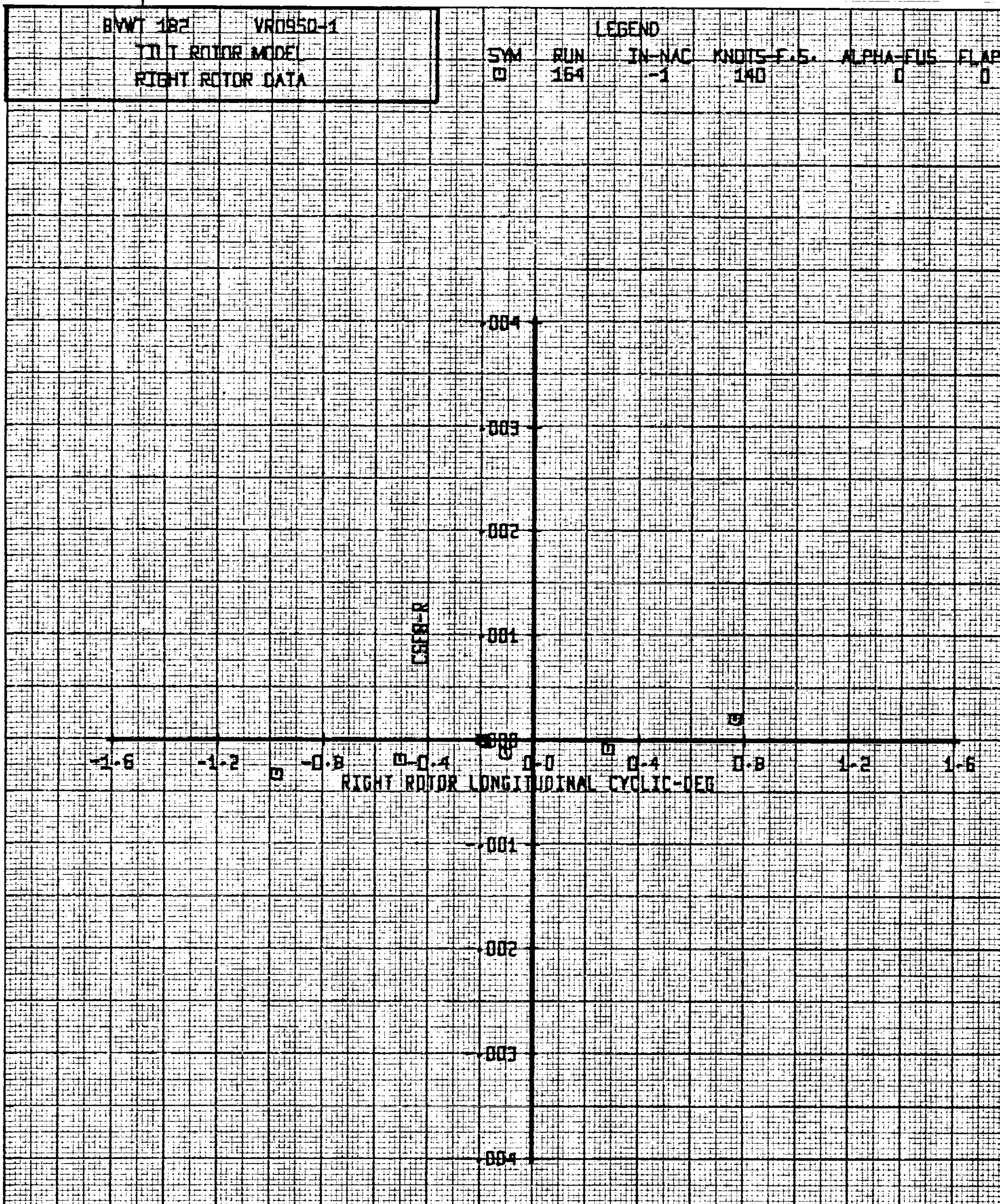


Figure 13-058. Right Rotor Side Force Coefficient Versus Right Rotor Long. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

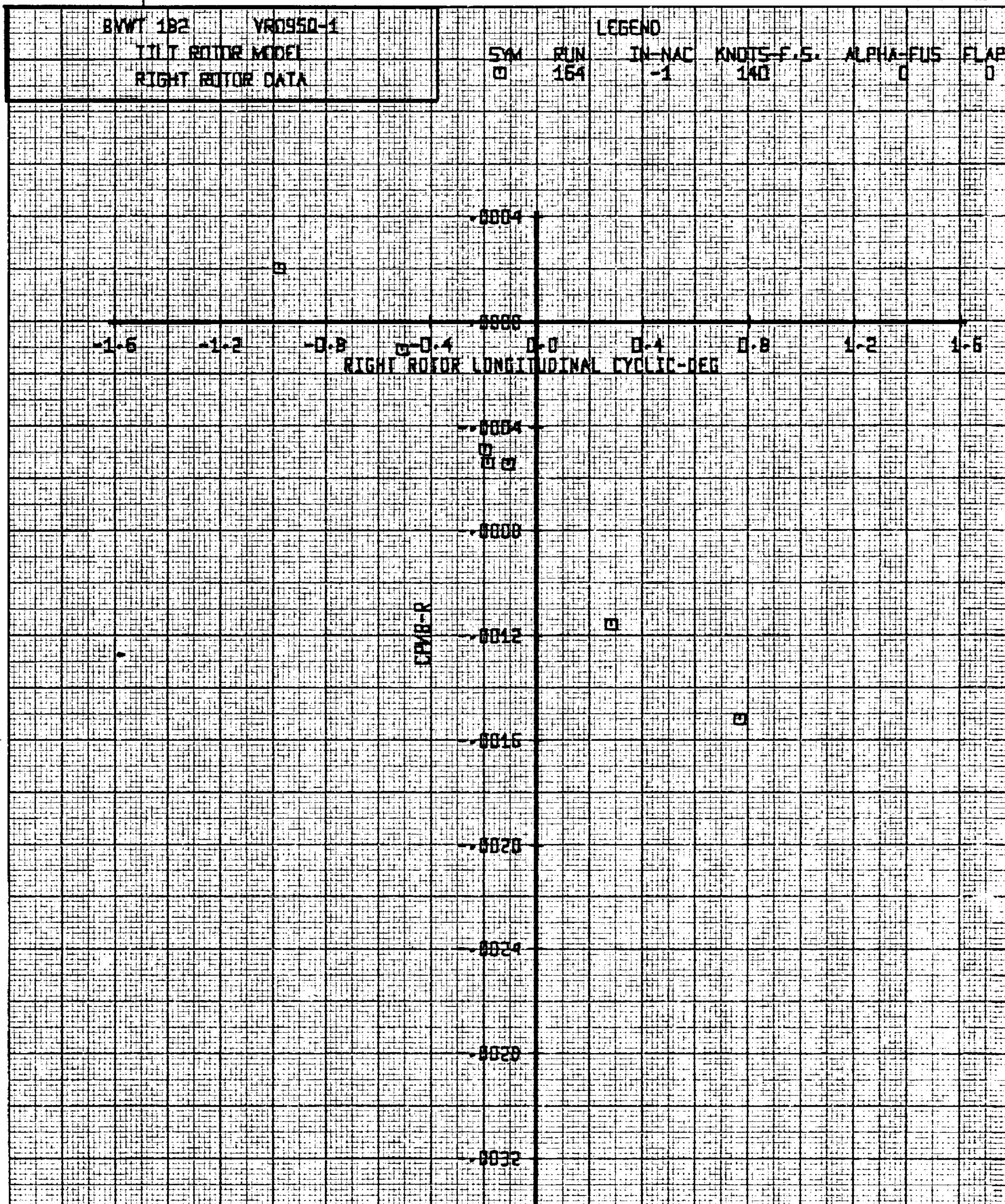


Figure 13-059. Right Rotor Pitching Moment Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

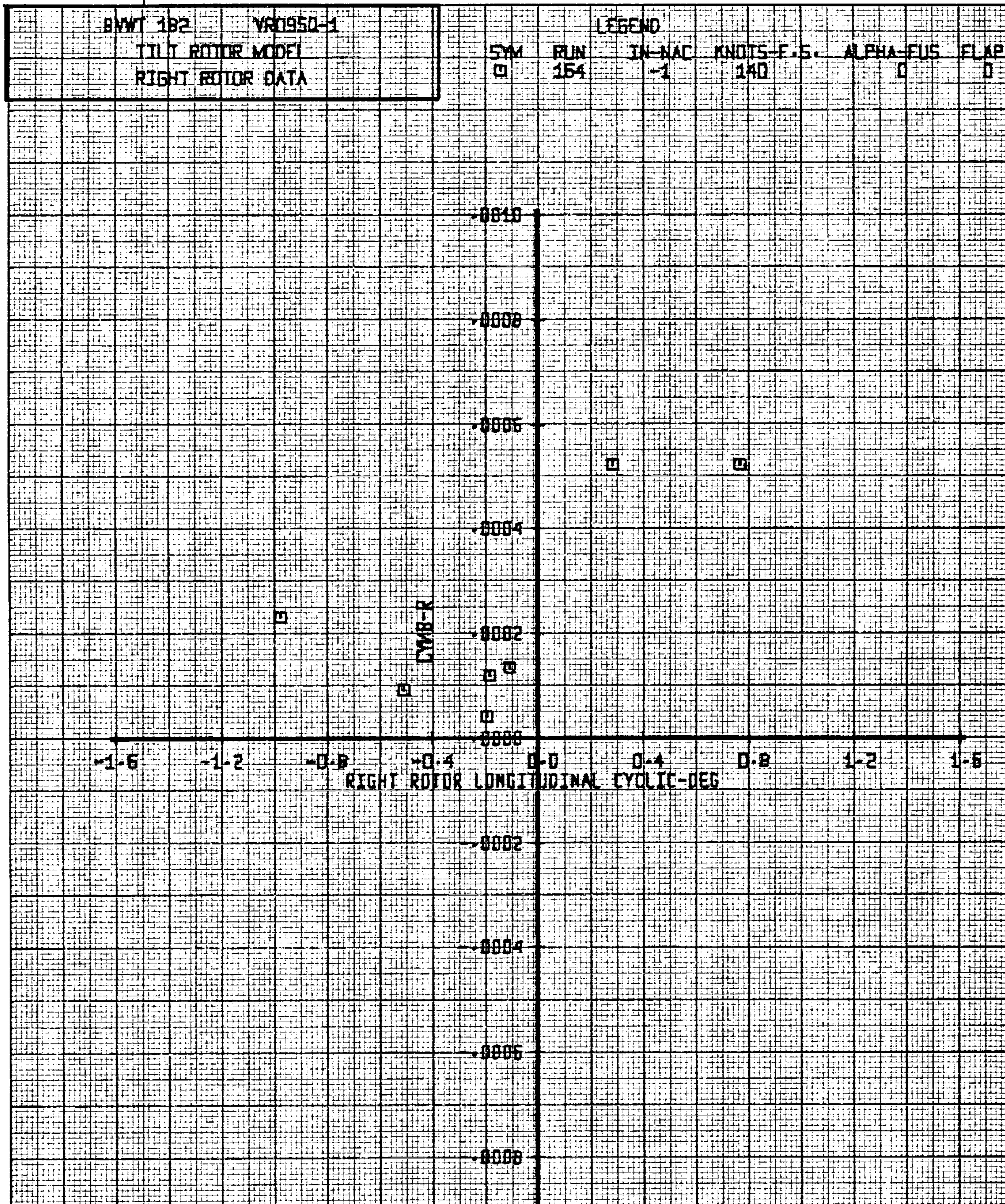


Figure 13-060. Right Rotor Yawing Moment Versus Right Rotor Long. cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

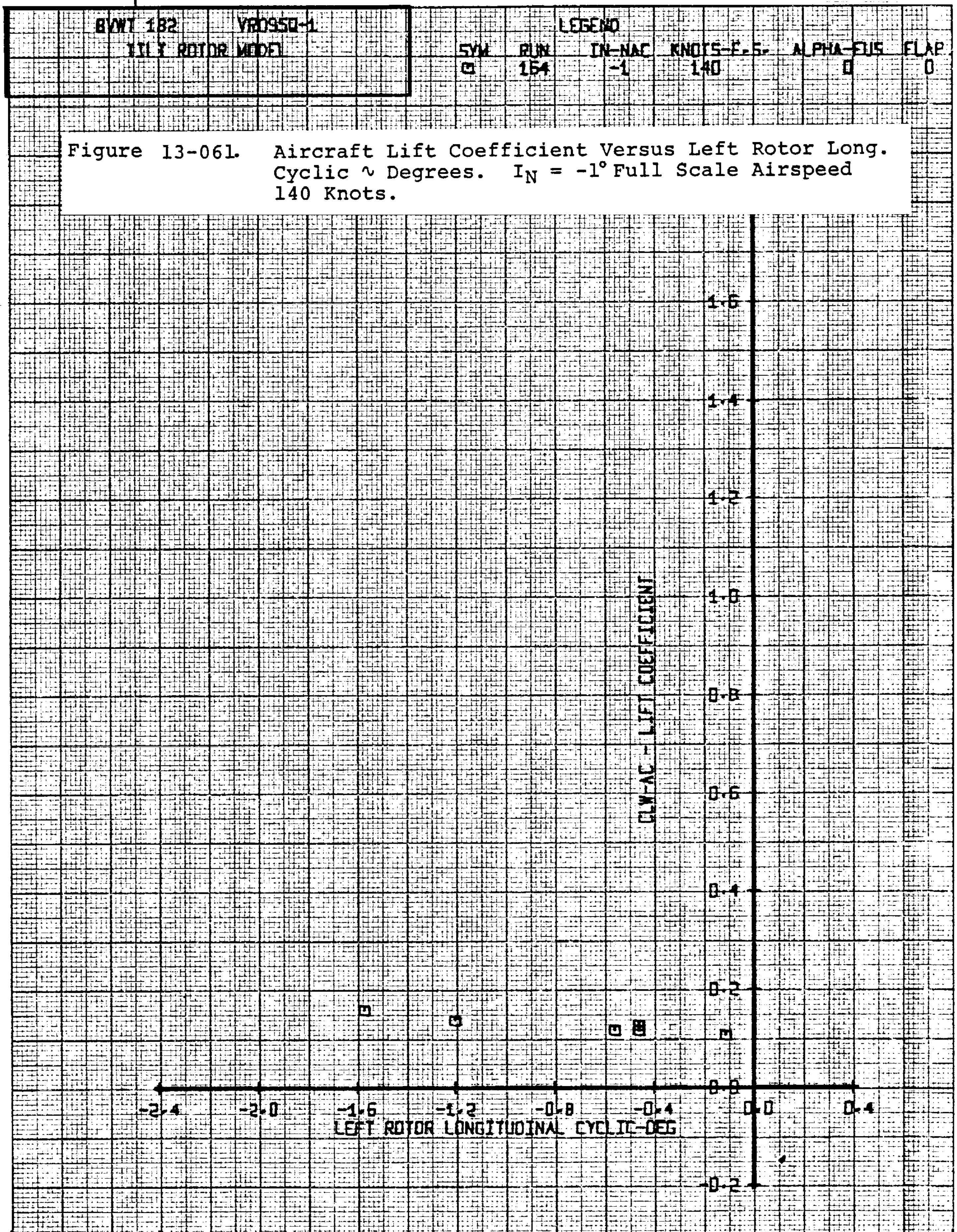


Figure 13-061. Aircraft Lift Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1^\circ$ Full Scale Airspeed 140 Knots.

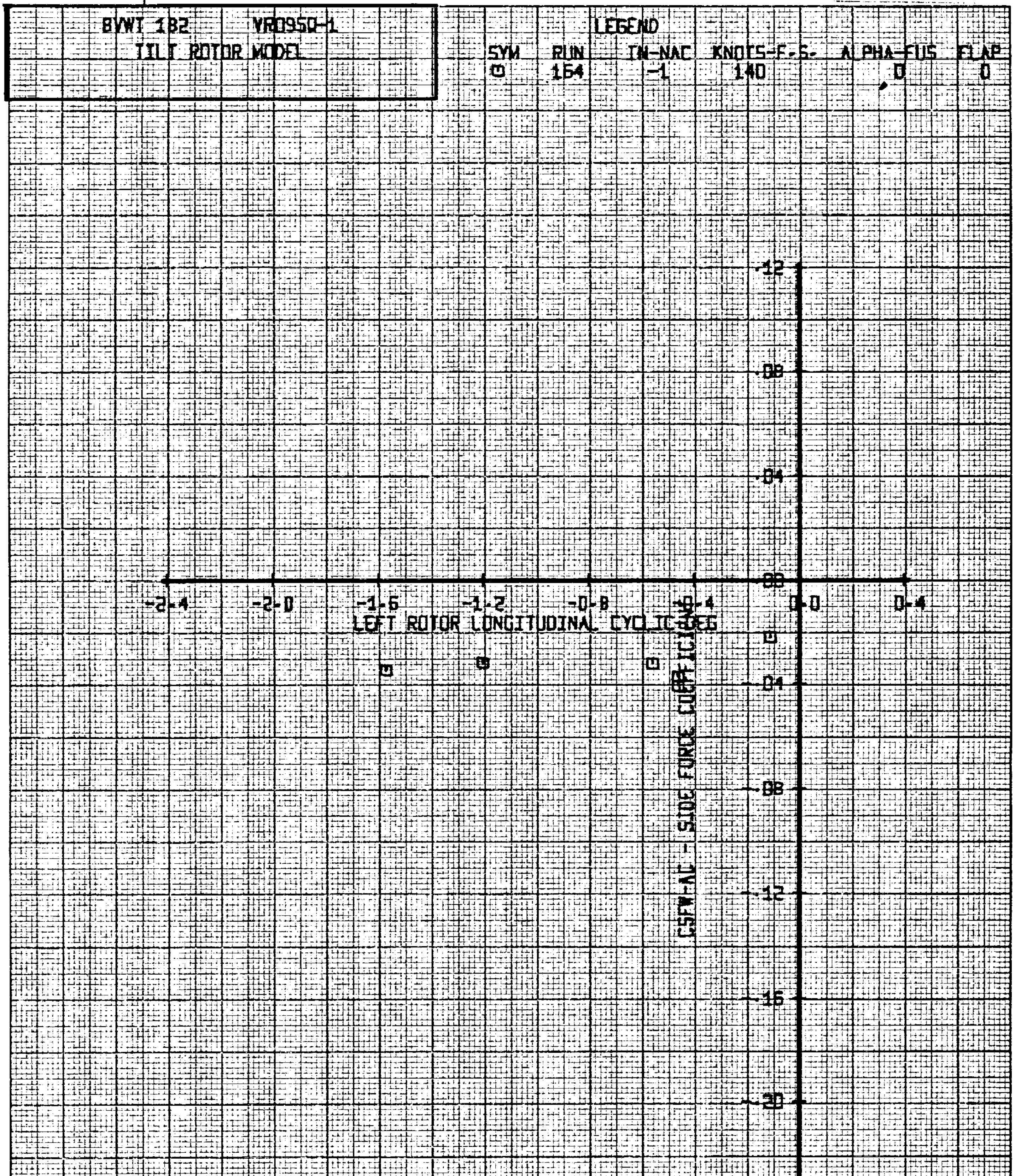


Figure 13-062. Aircraft Side Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

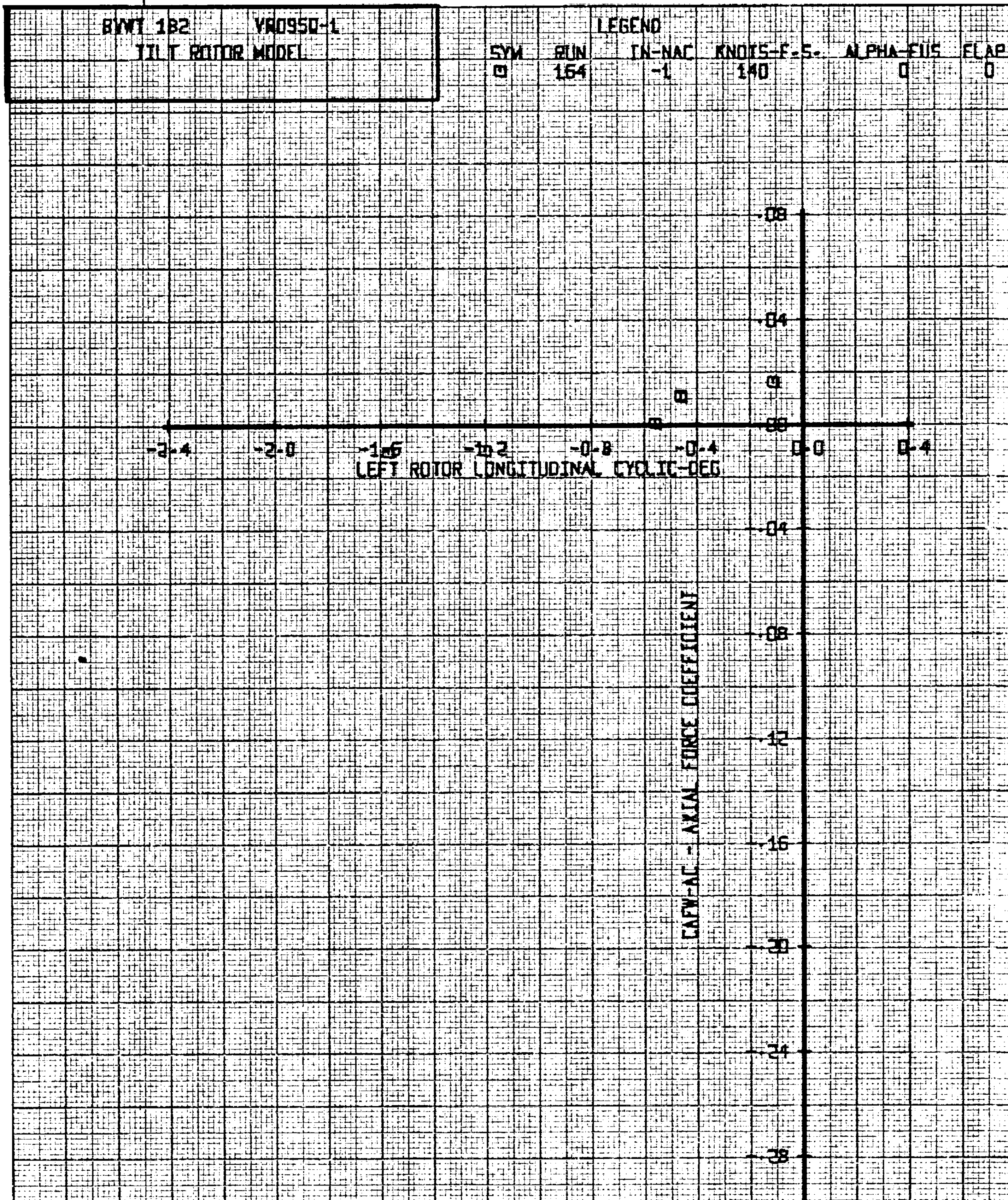


Figure 13-063. Aircraft Axial Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

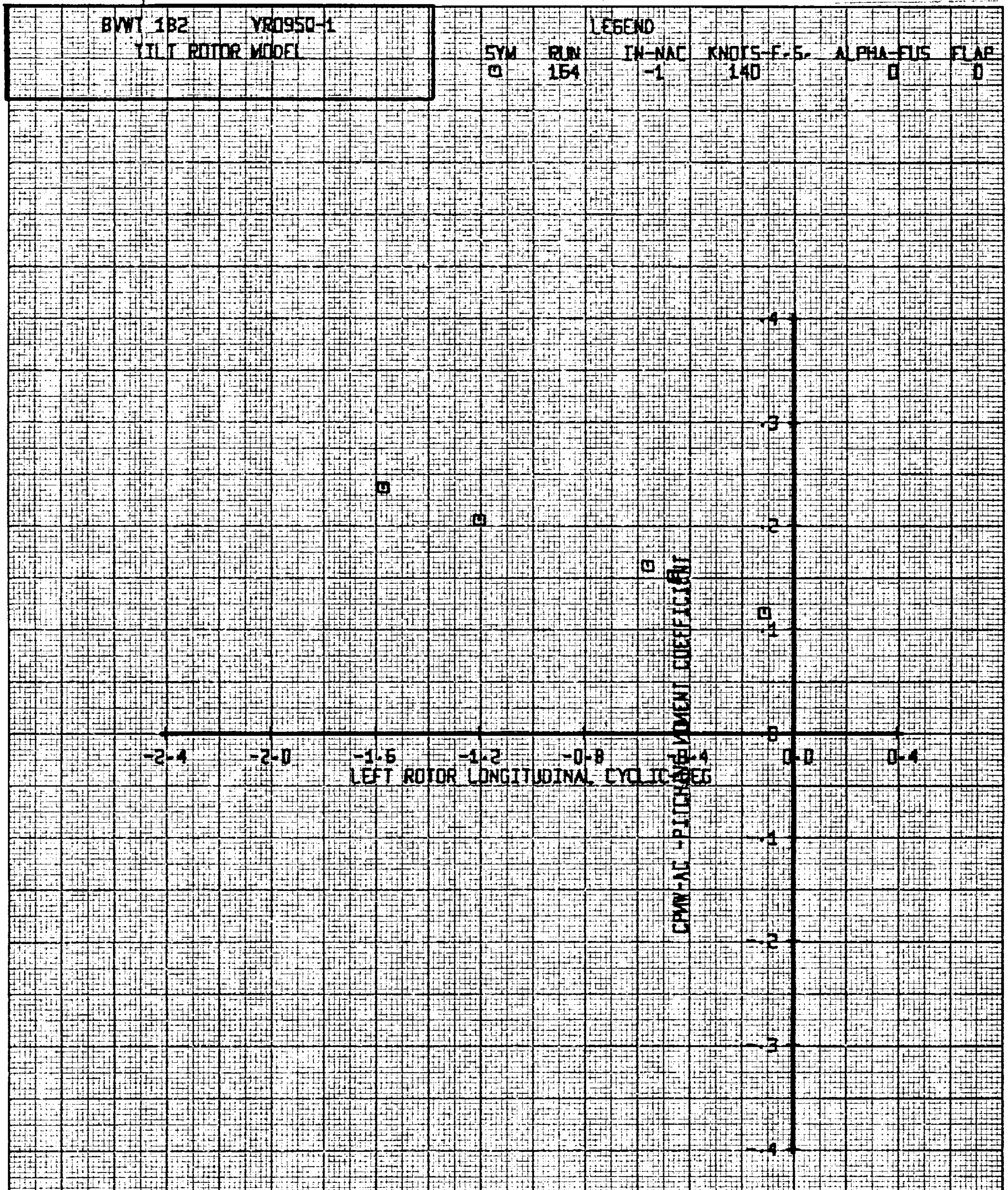


Figure 13-064. Aircraft Pitching Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

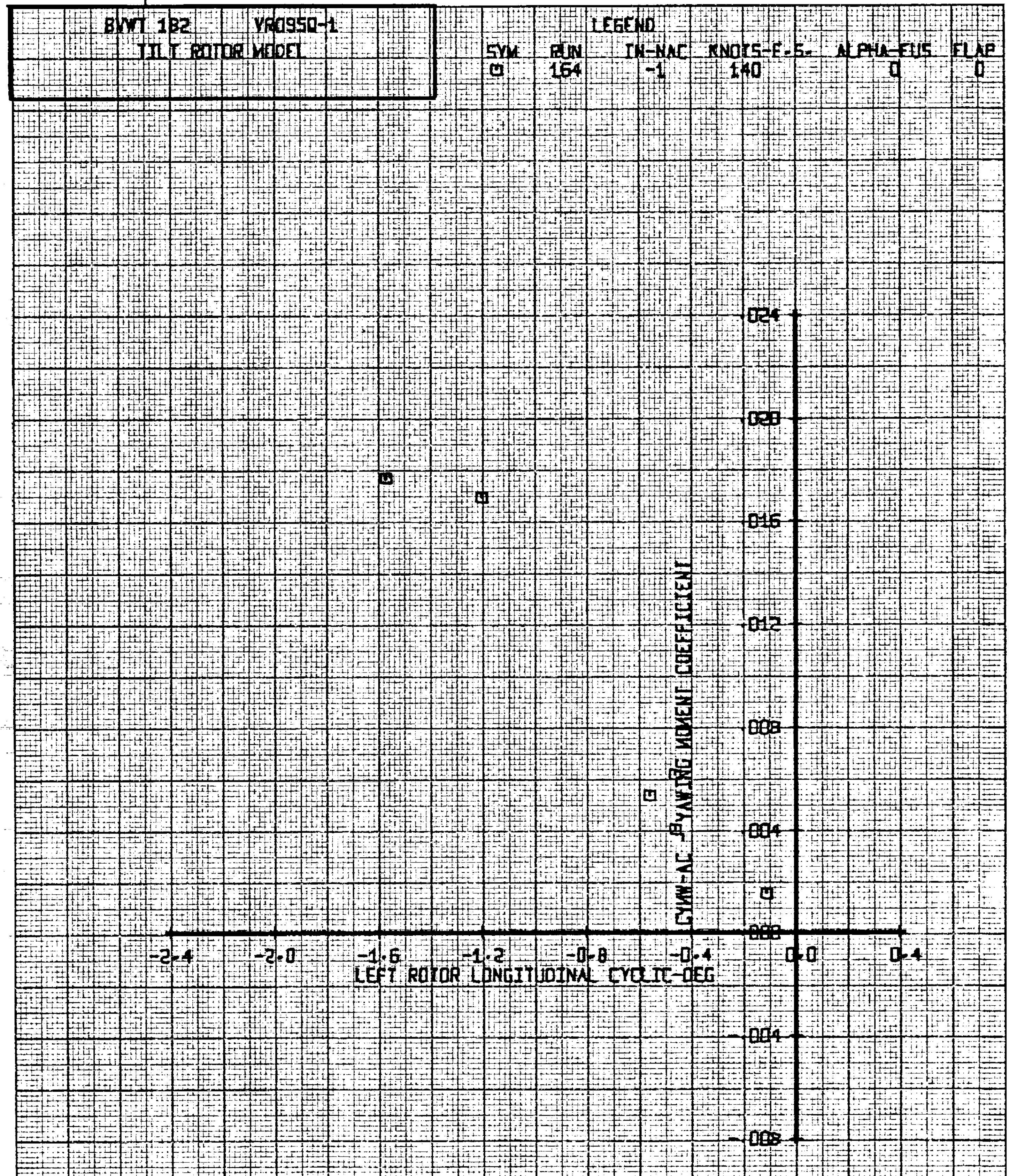
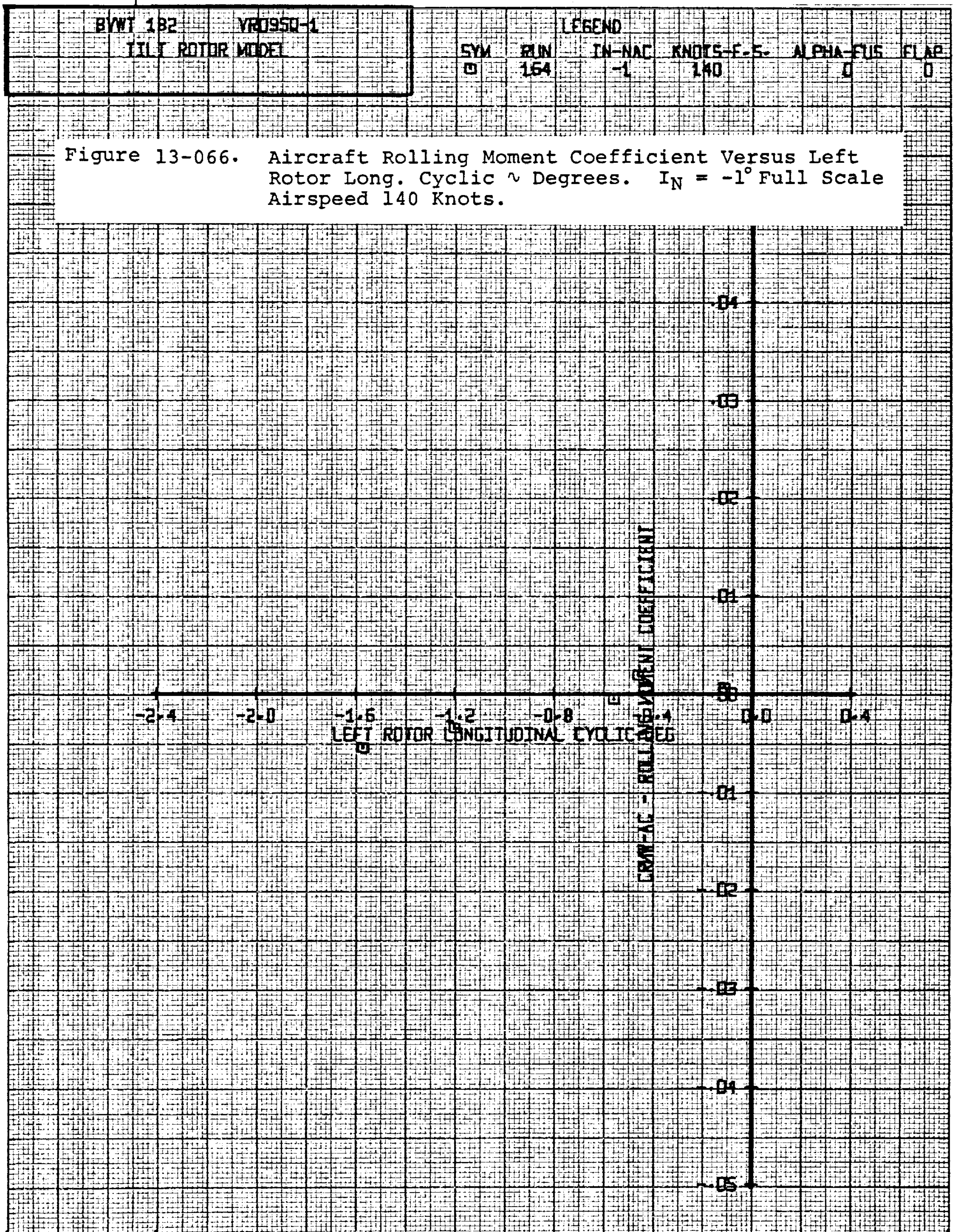


Figure 13-065. Aircraft Yawing Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

Figure 13-066. Aircraft Rolling Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.



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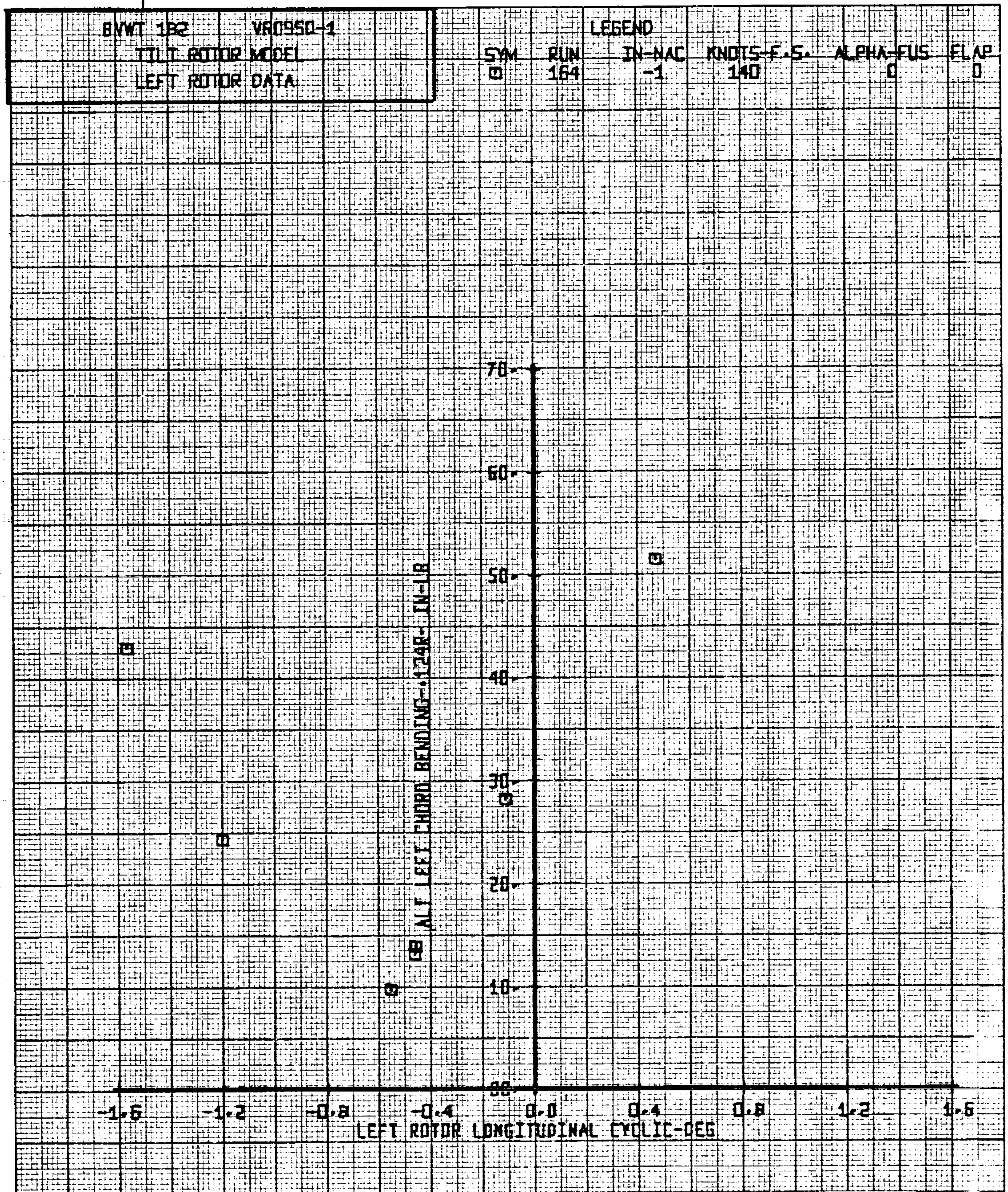

Figure 13-067. Alt. Left Chord Bending Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

Figure 13-068. Alt. Left Flap Bending Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

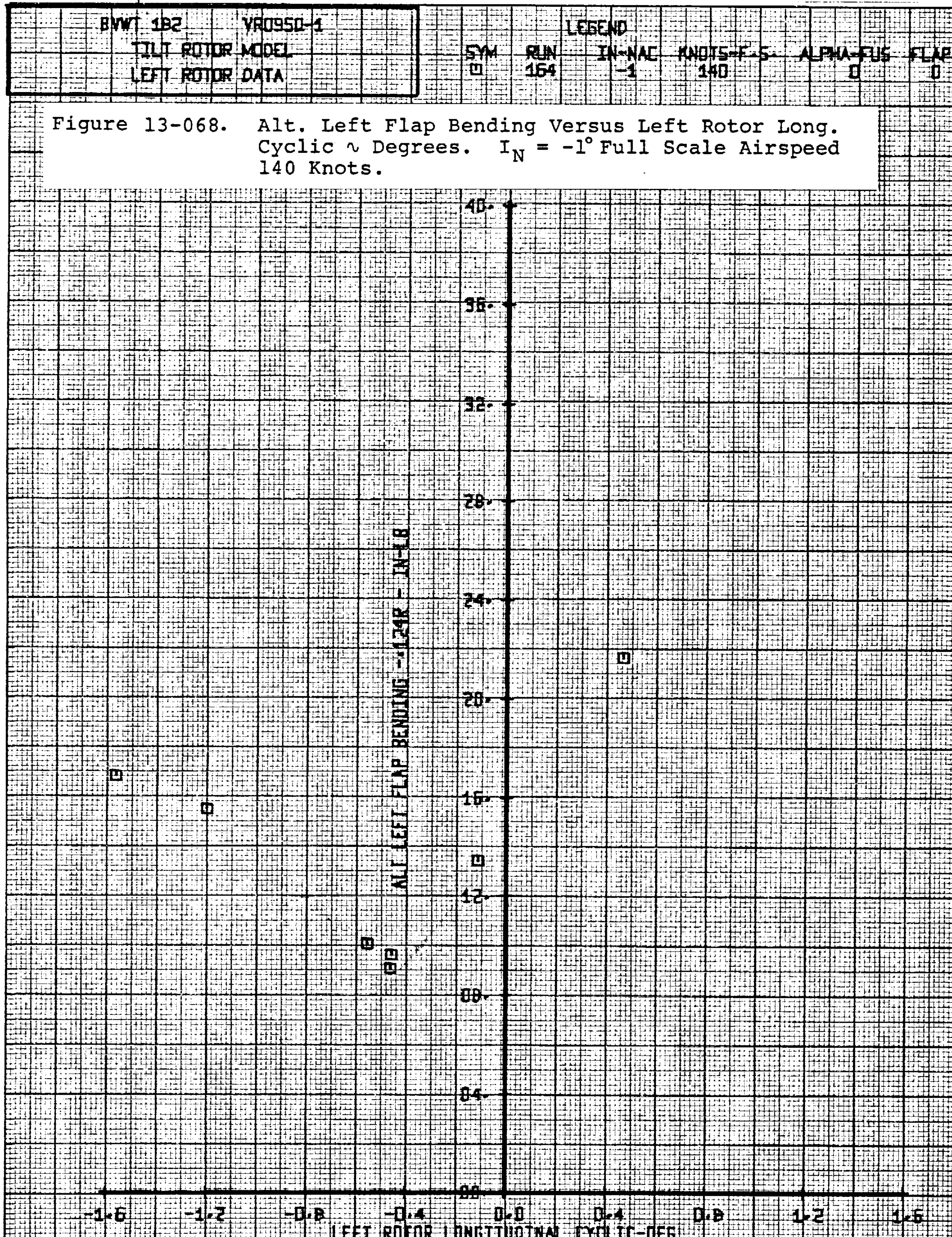

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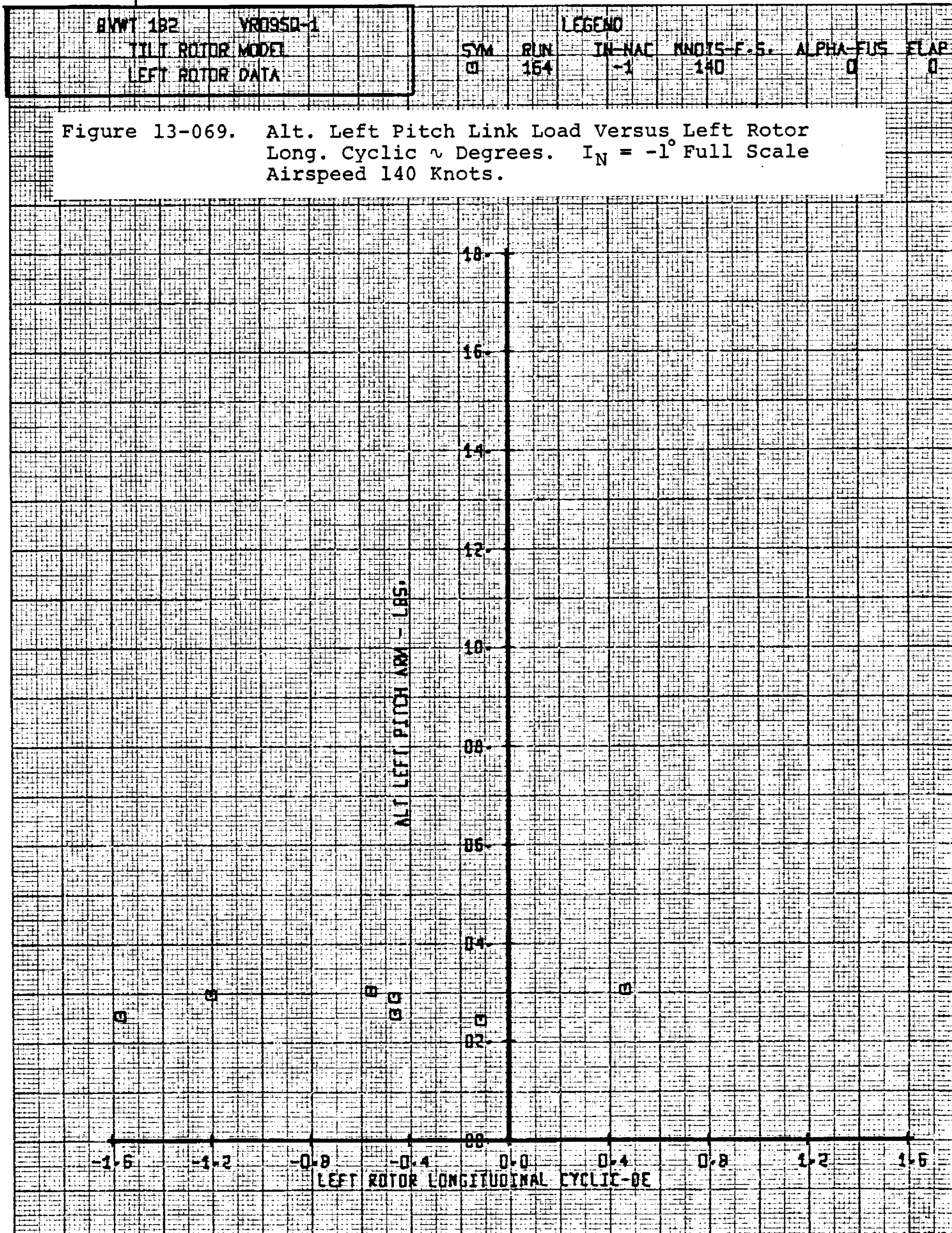
Figure 13-069. Alt. Left Pitch Link Load Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.



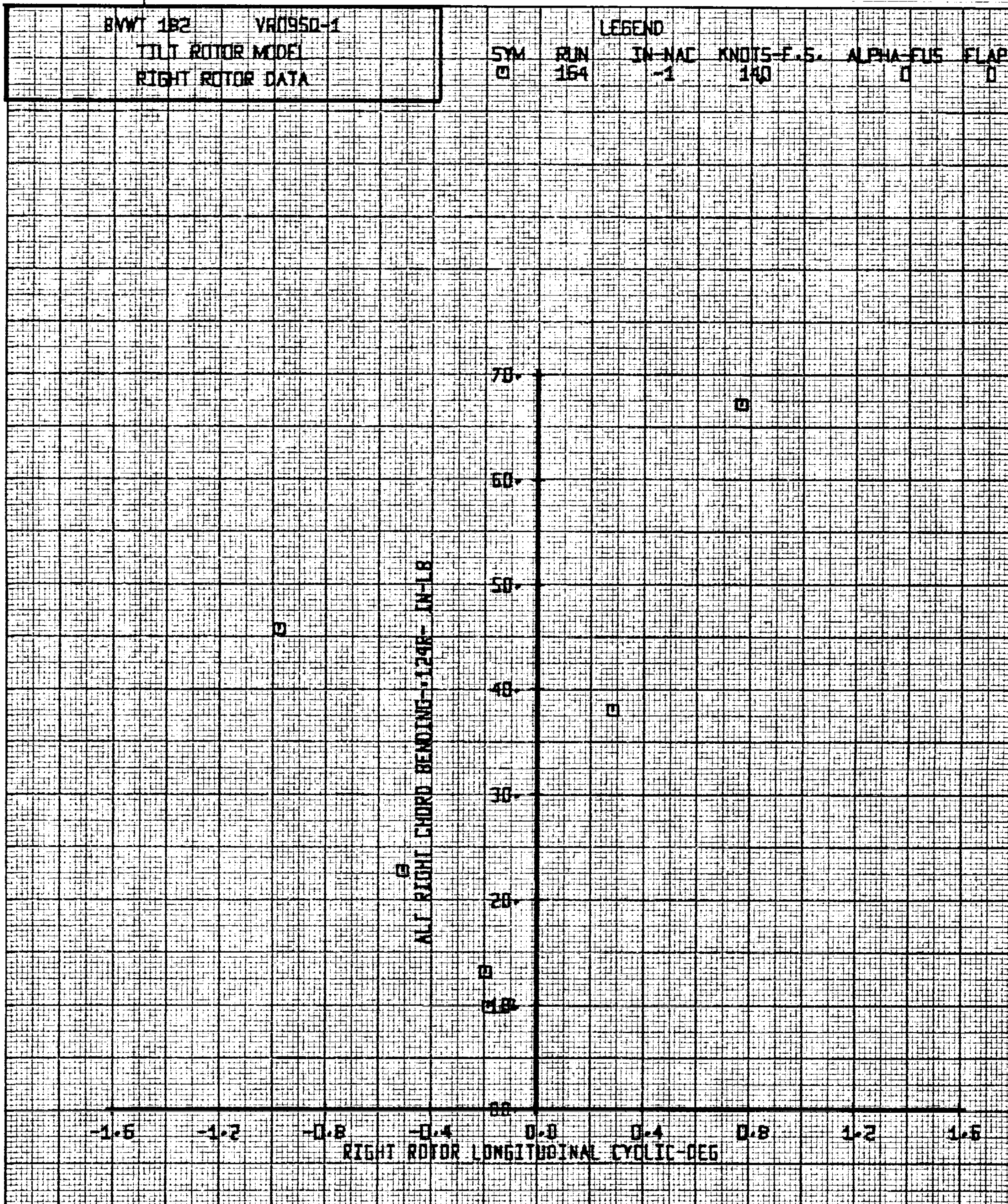


Figure 13-070. Alt. Right Chord Bending Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1^\circ$ Full Scale Airspeed 140 Knots.

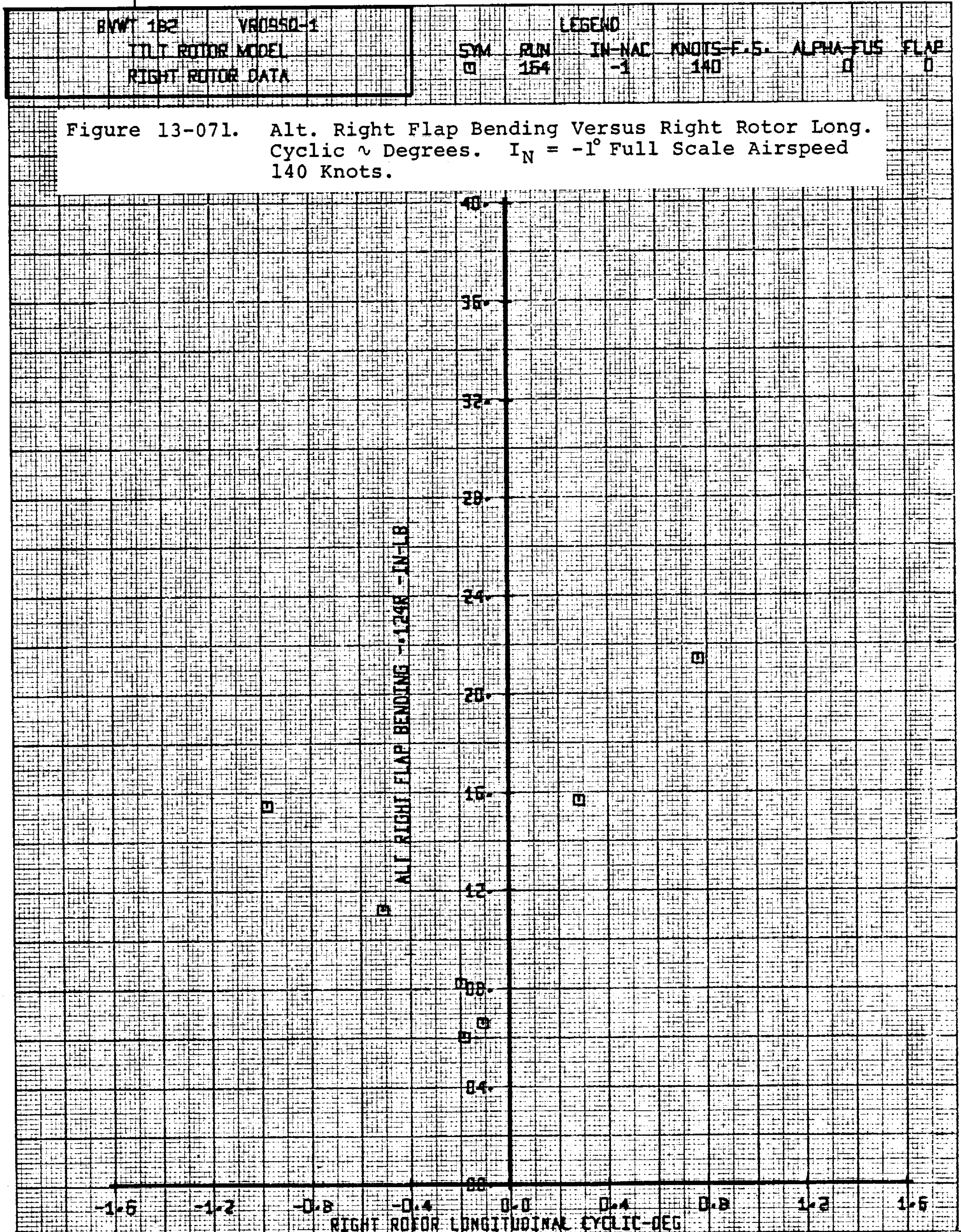


Figure 13-071. Alt. Right Flap Bending Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1^\circ$ Full Scale Airspeed 140 Knots.

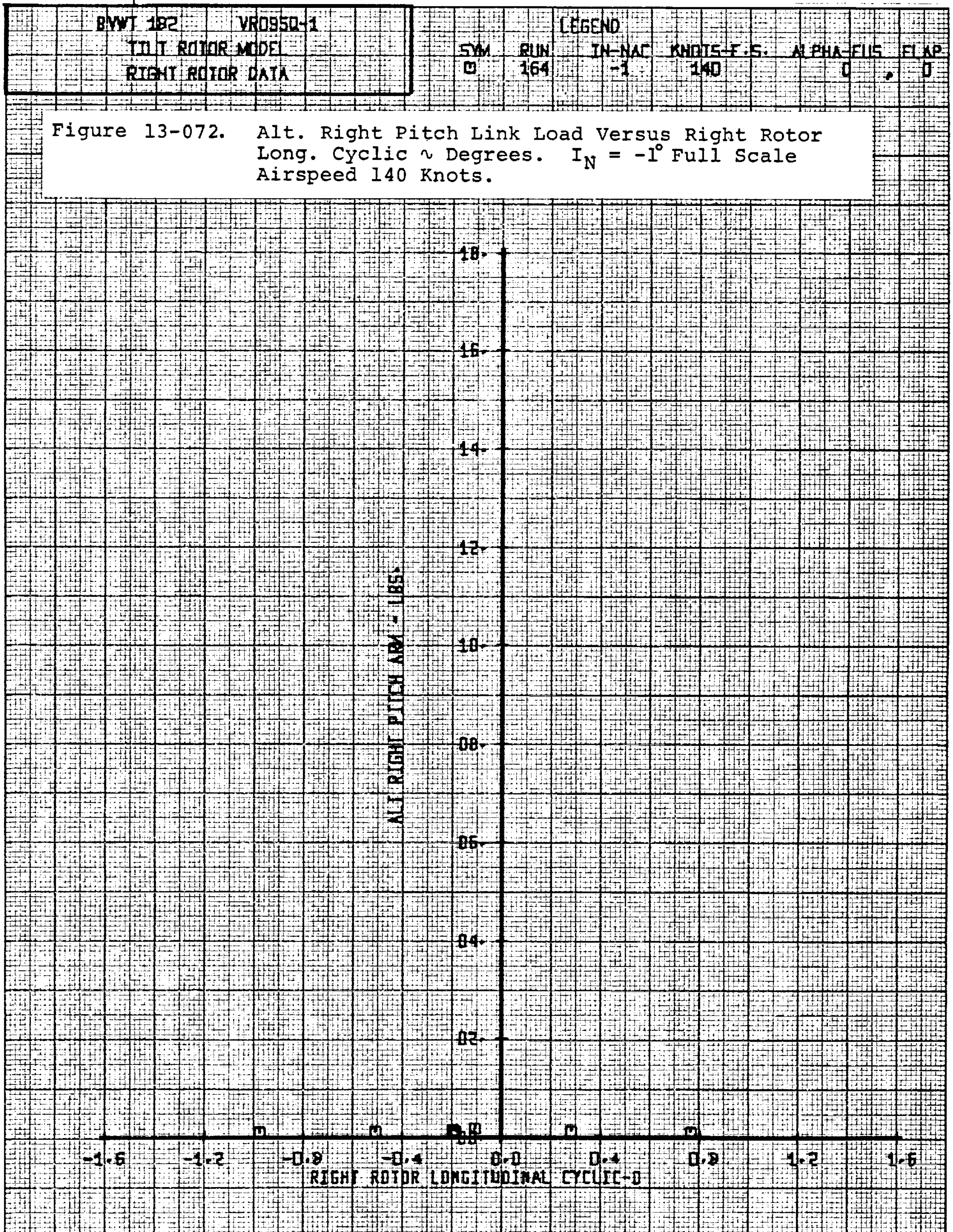


Figure 13-072. Alt. Right Pitch Link Load Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1^\circ$ Full Scale Airspeed 140 Knots.

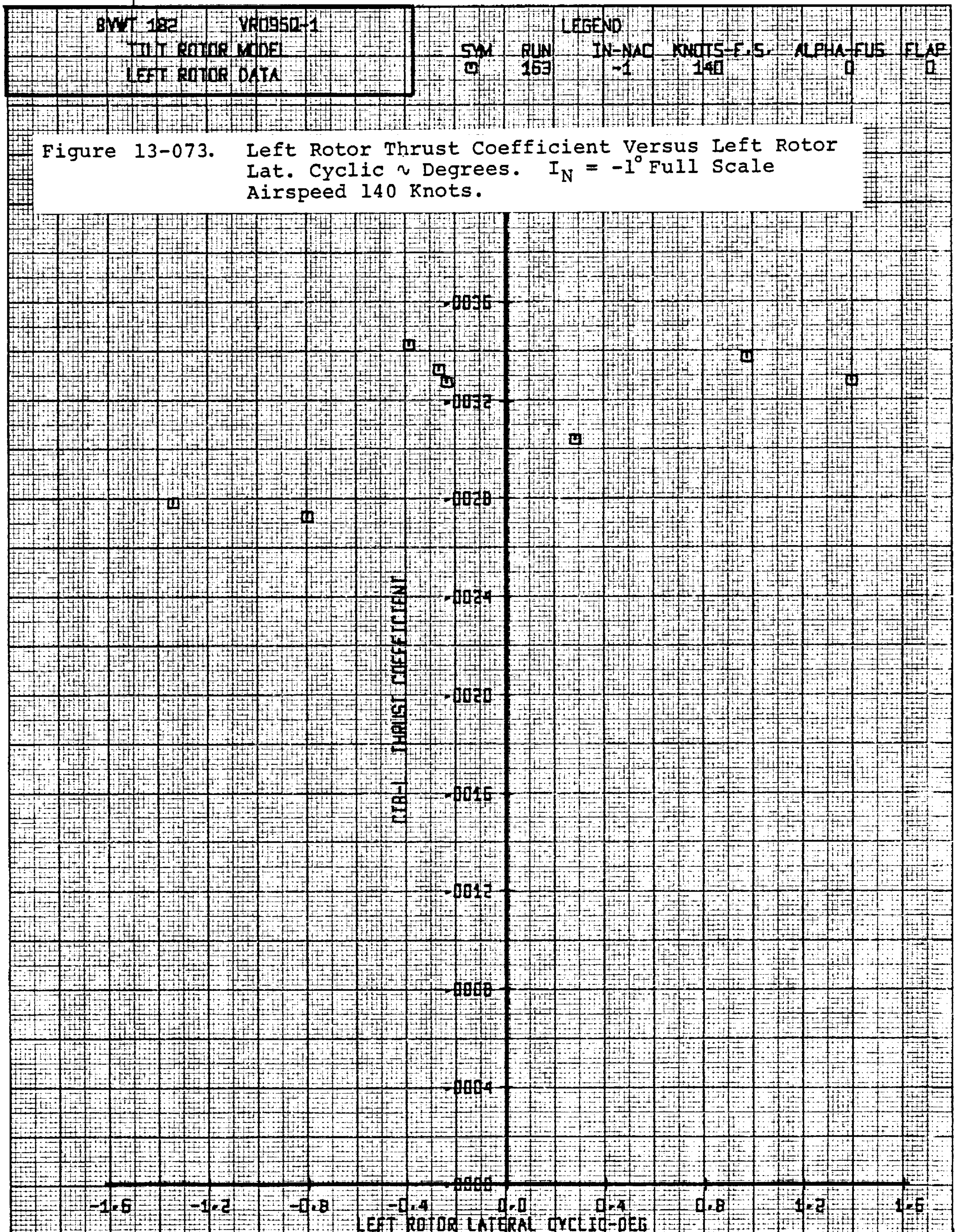
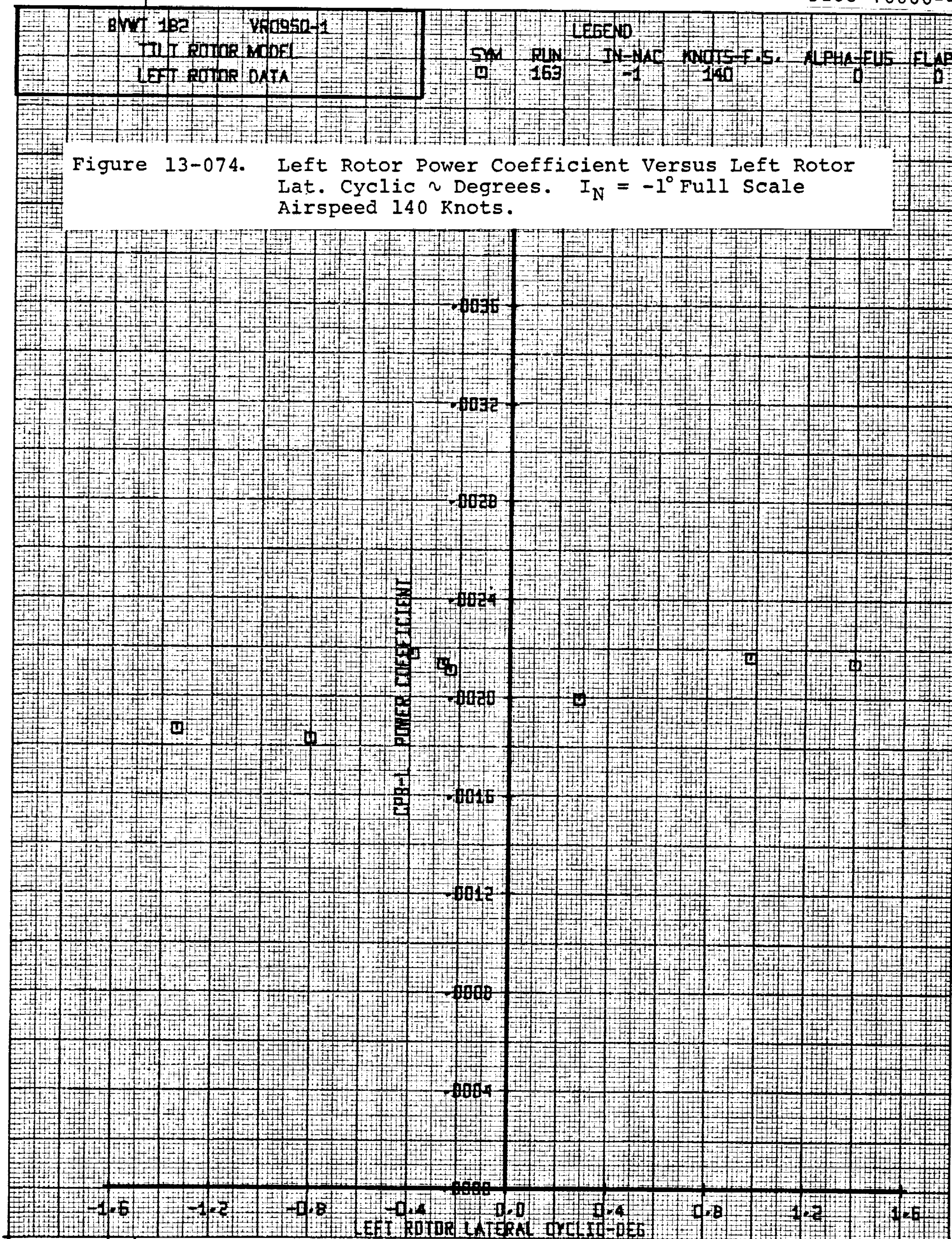


Figure 13-073. Left Rotor Thrust Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1^\circ$ Full Scale Airspeed 140 Knots.

Figure 13-074. Left Rotor Power Coefficient Versus Left Rotor Lat. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.



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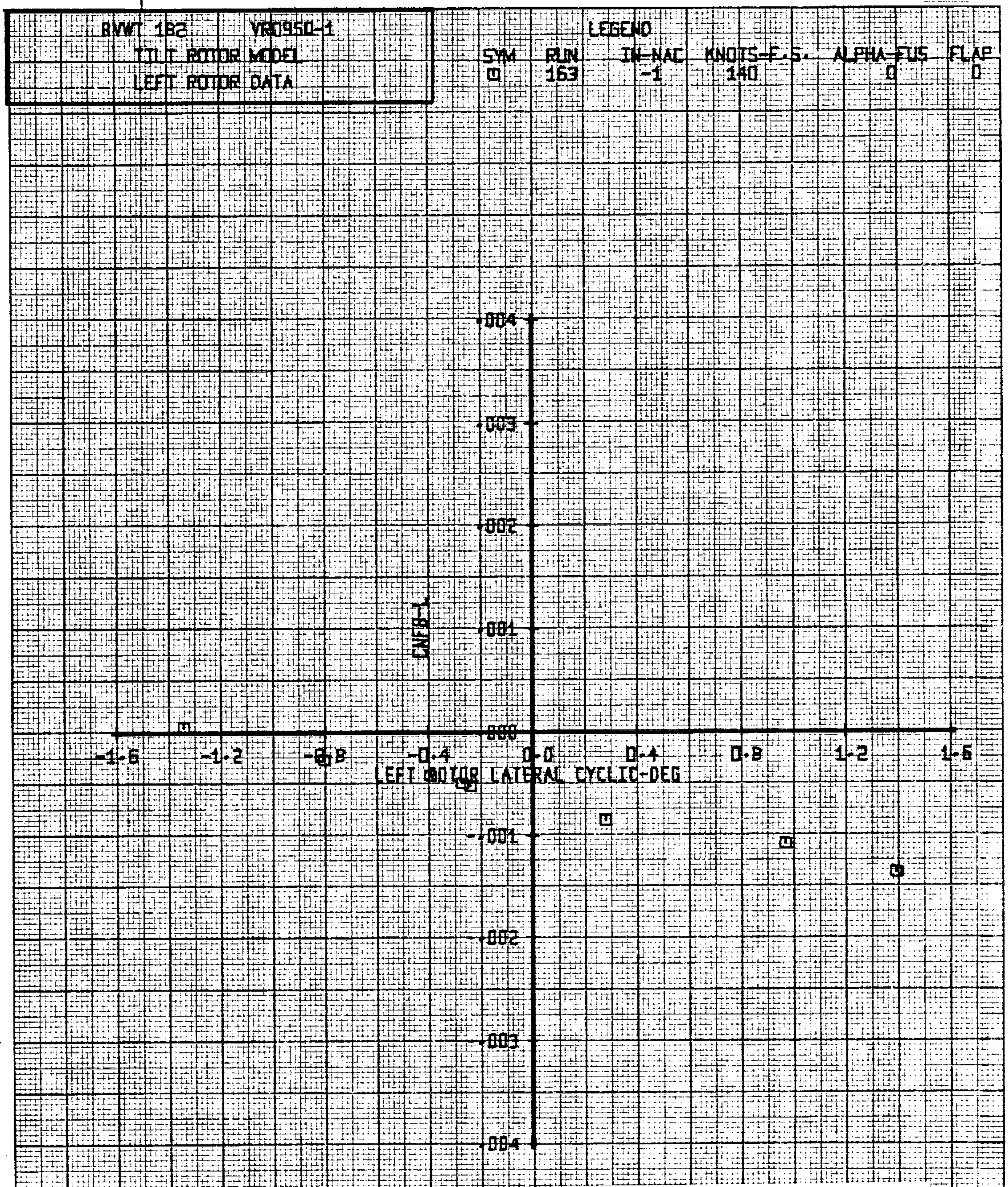


Figure 13-075. Left Rotor Normal Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

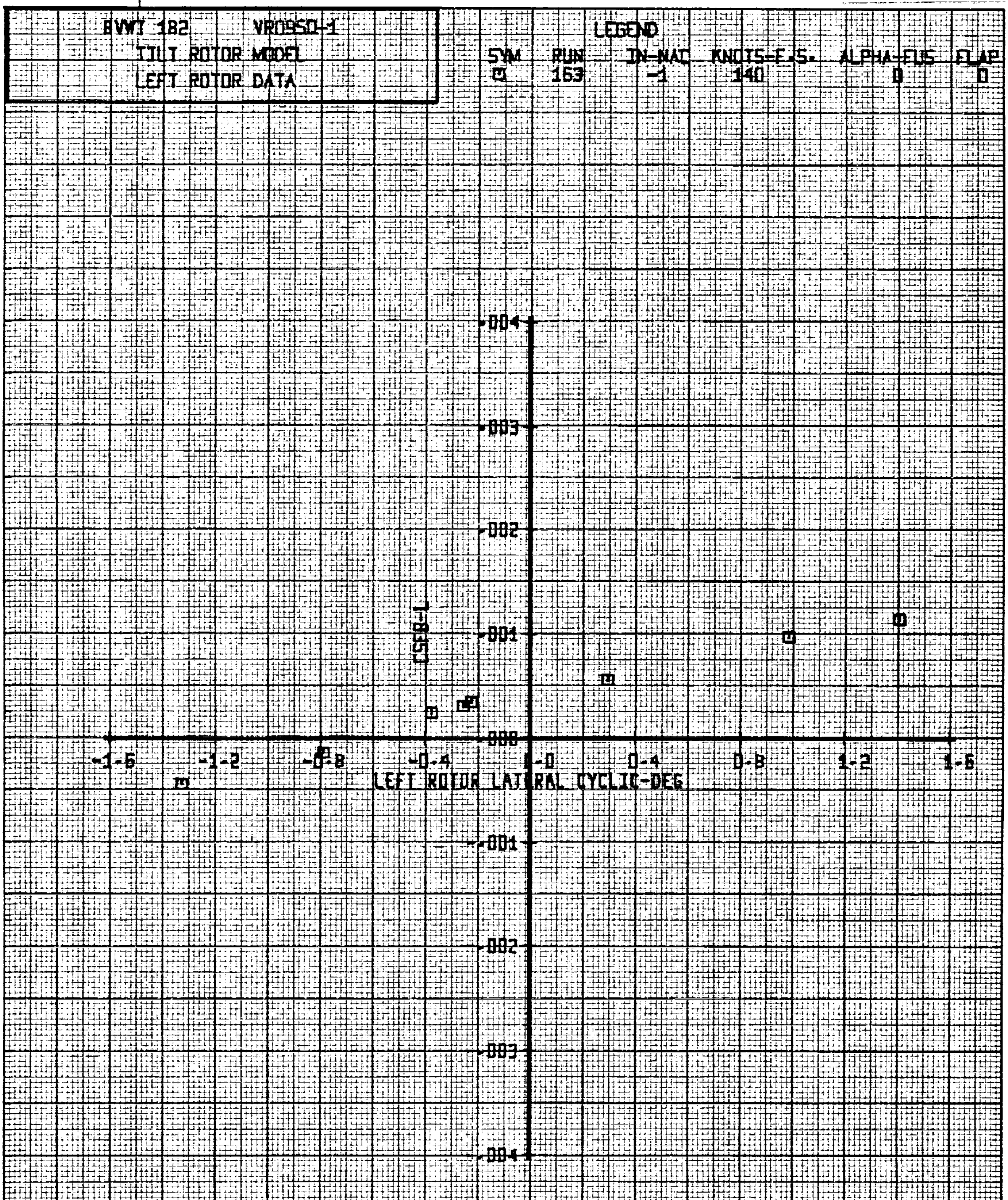


Figure 13-076. Left Rotor Side Force Coefficient Versus Left Rotor Lat. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

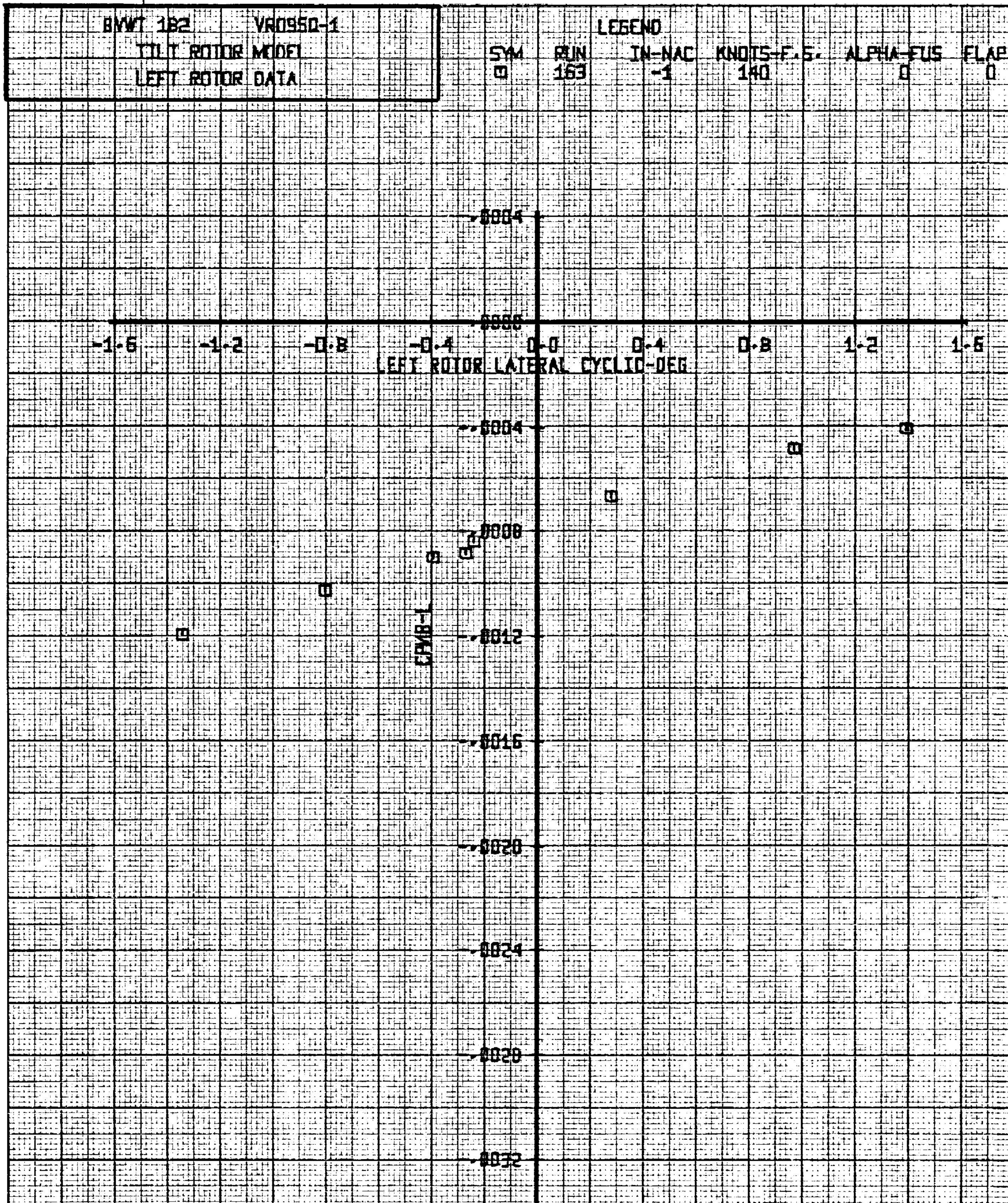


Figure 13-077. Left Rotor Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

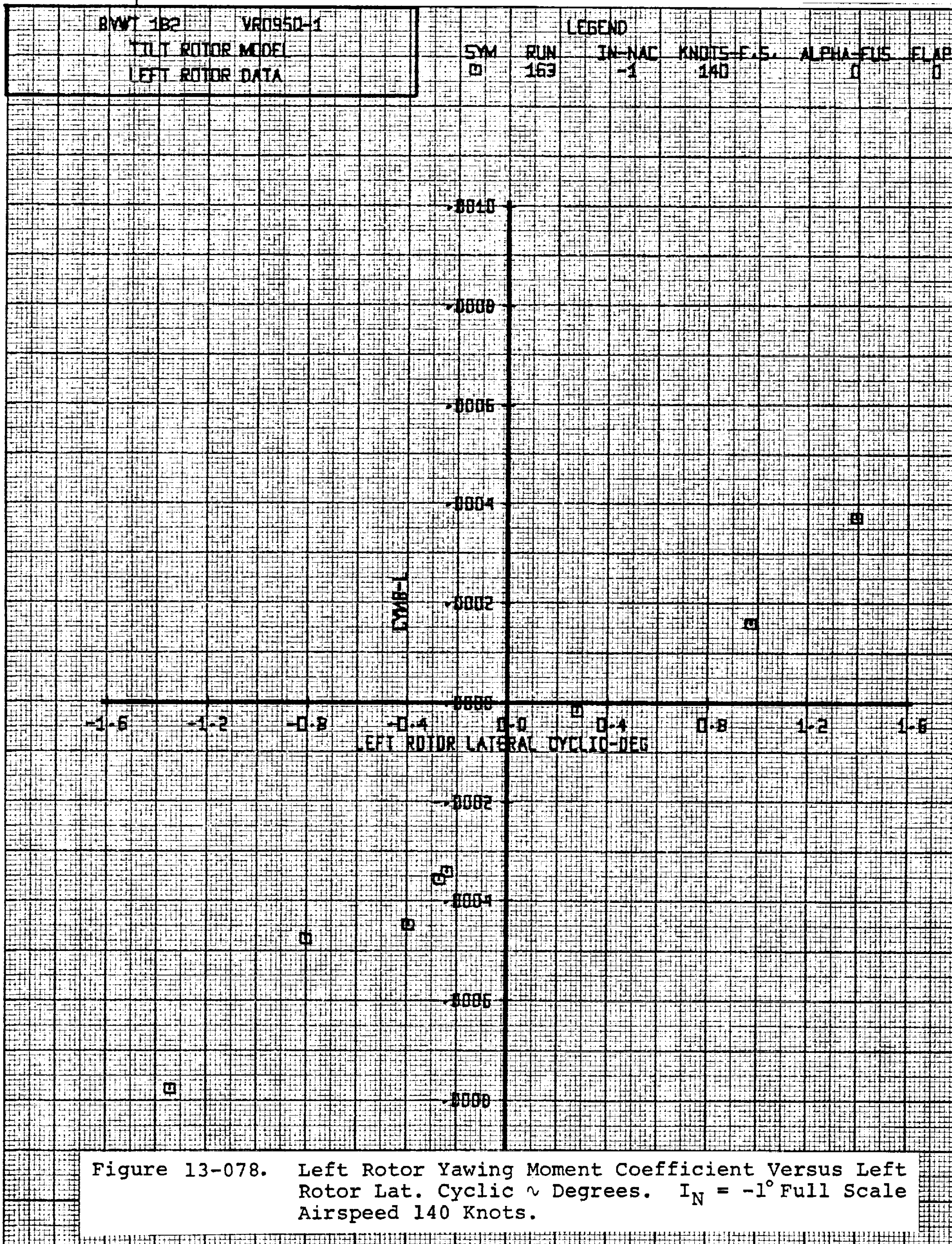
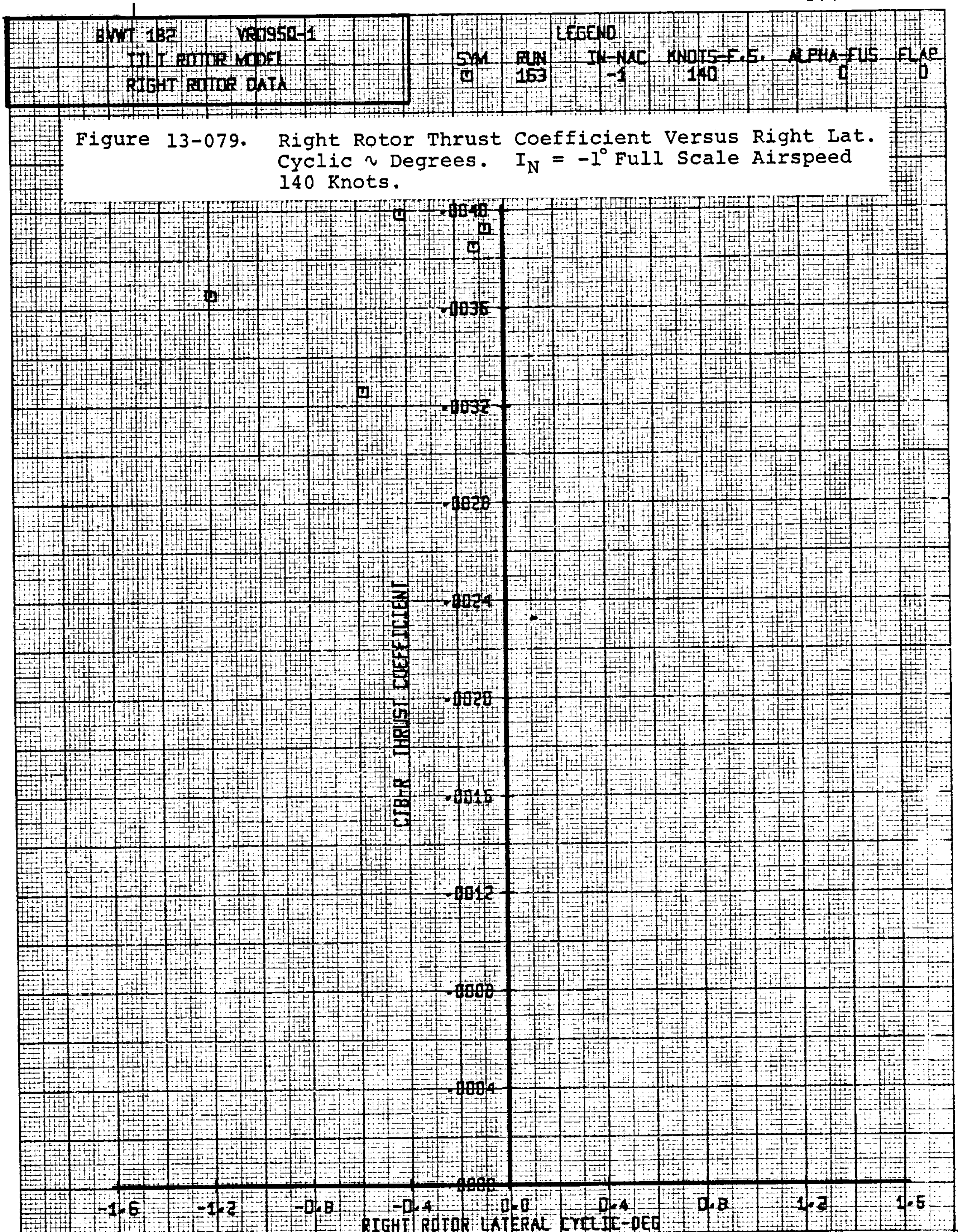


Figure 13-078. Left Rotor Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

Figure 13-079. Right Rotor Thrust Coefficient Versus Right Lat. Cyclic ∿ Degrees. $I_N = -1^{\circ}$ Full Scale Airspeed 140 Knots.



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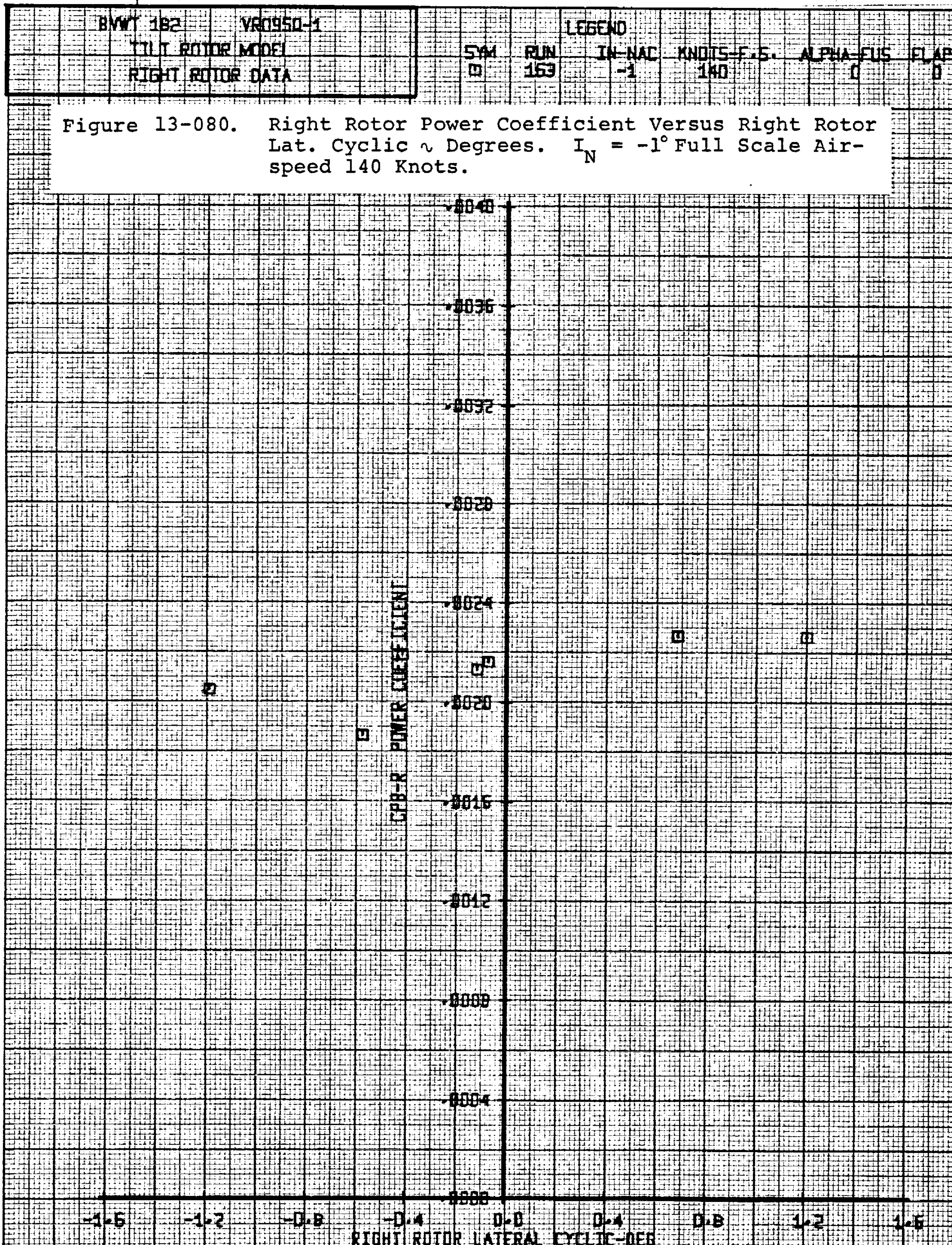


Figure 13-080. Right Rotor Power Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

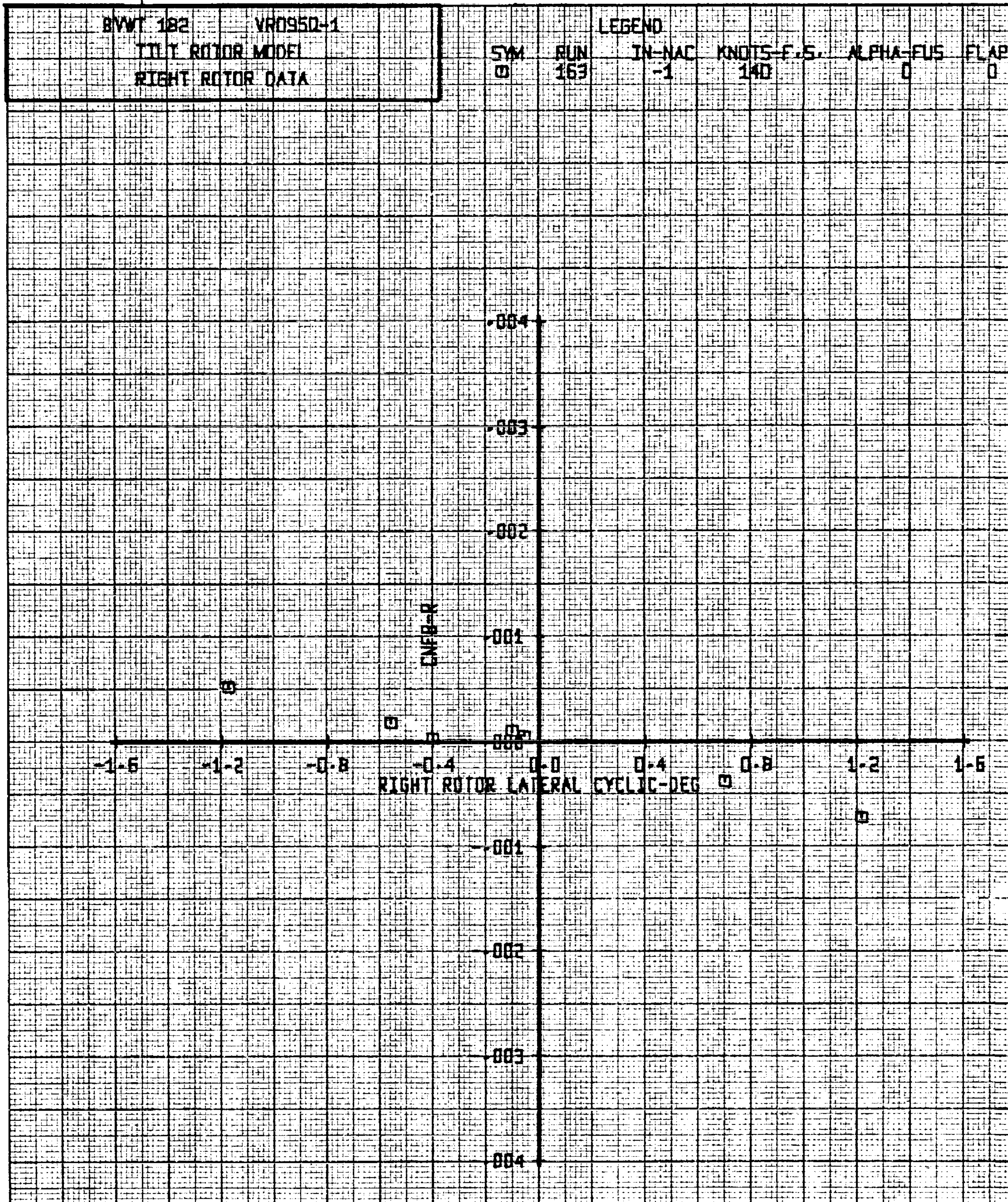


Figure 13-081. Right Rotor Normal Force Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

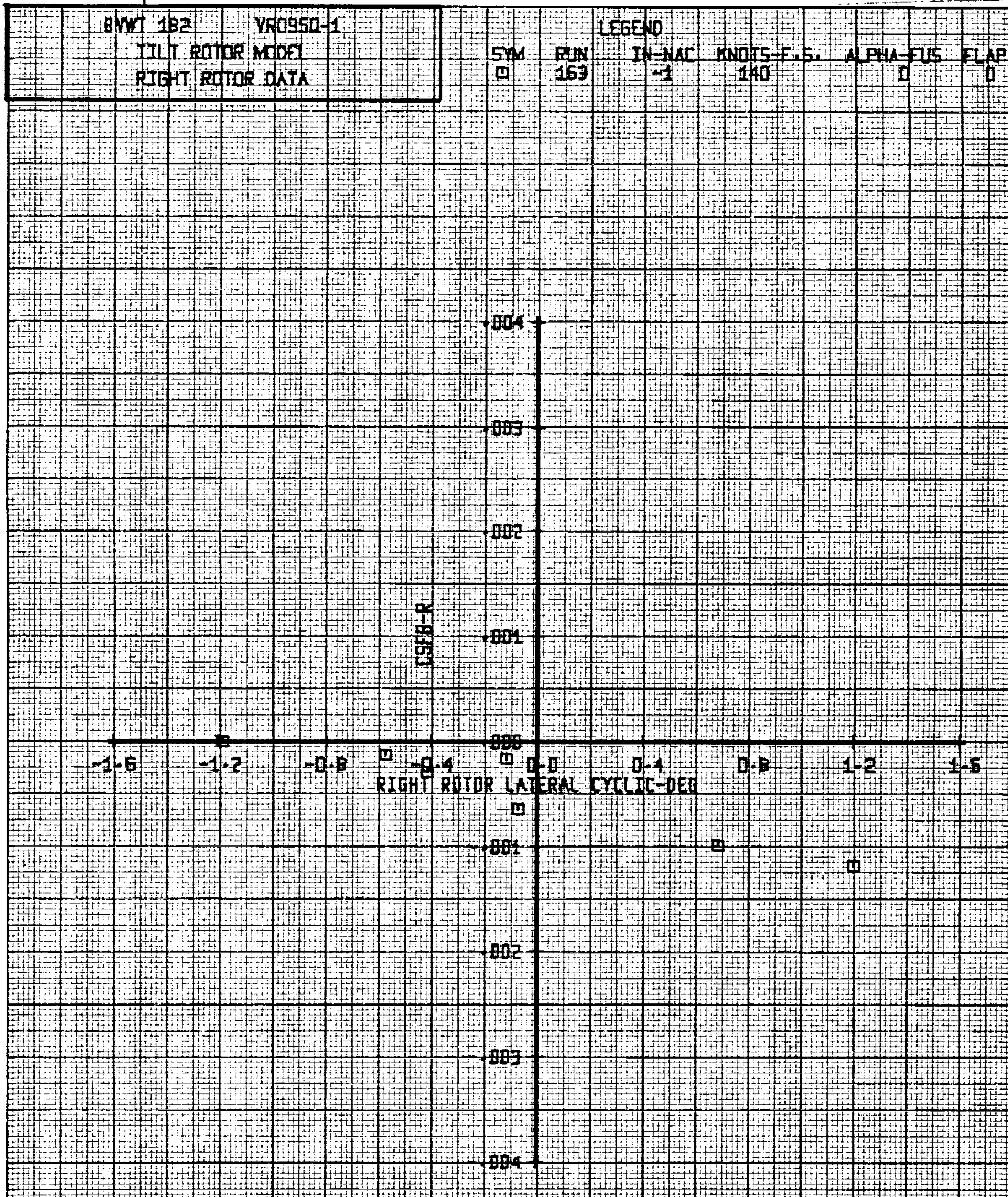


Figure 13-082. Right Rotor Side Force Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

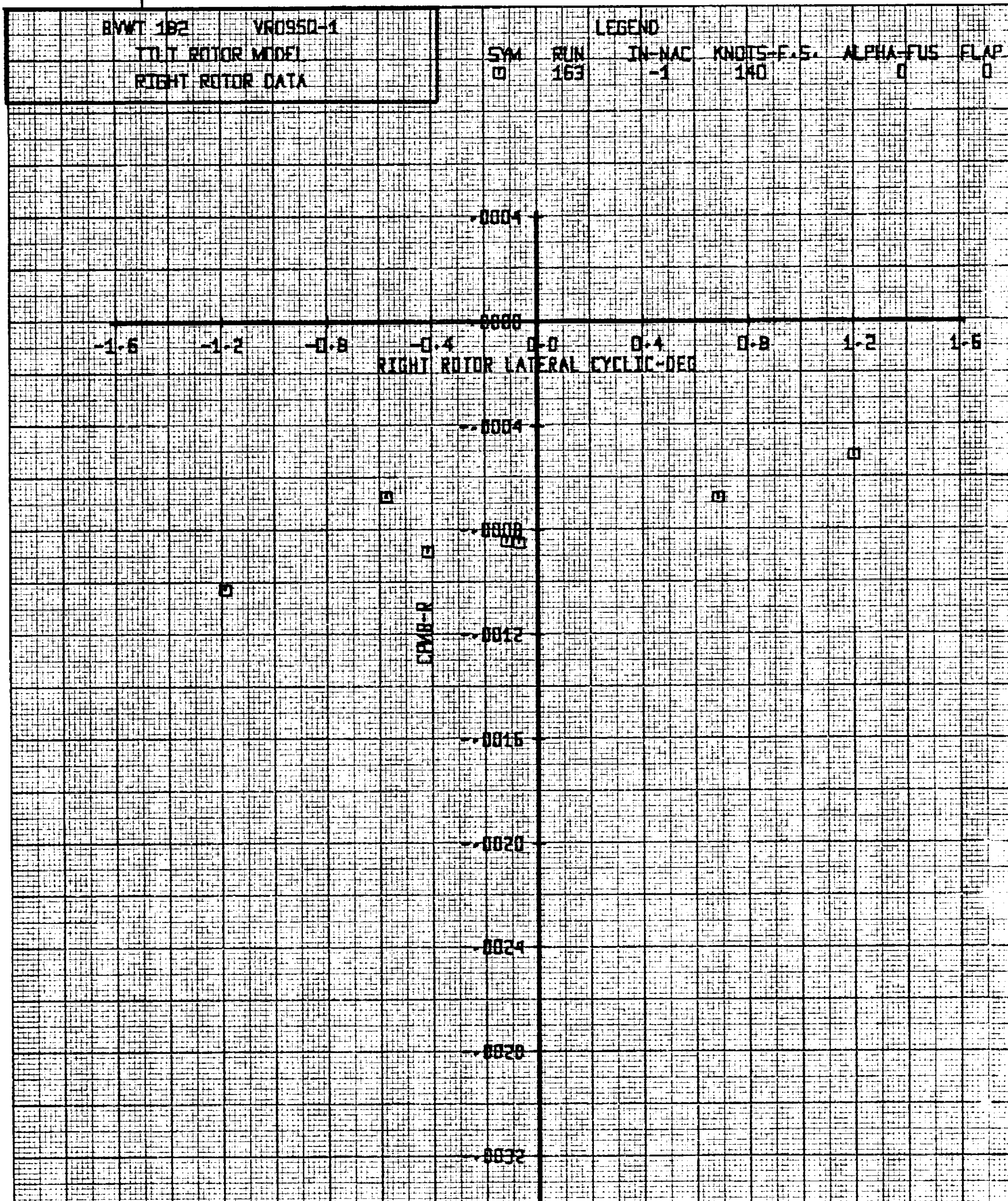


Figure 13-083. Right Rotor Pitching Moment Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

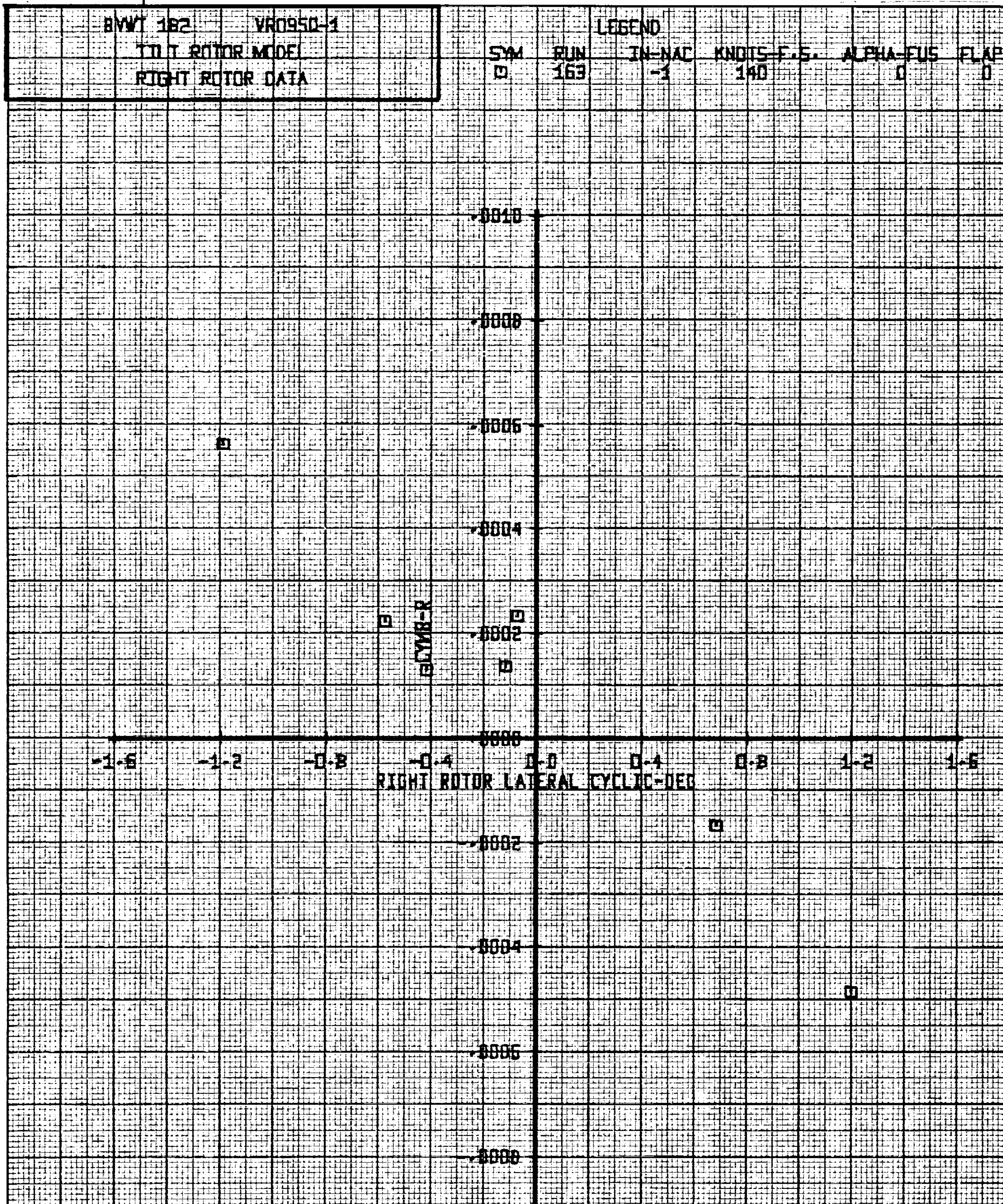
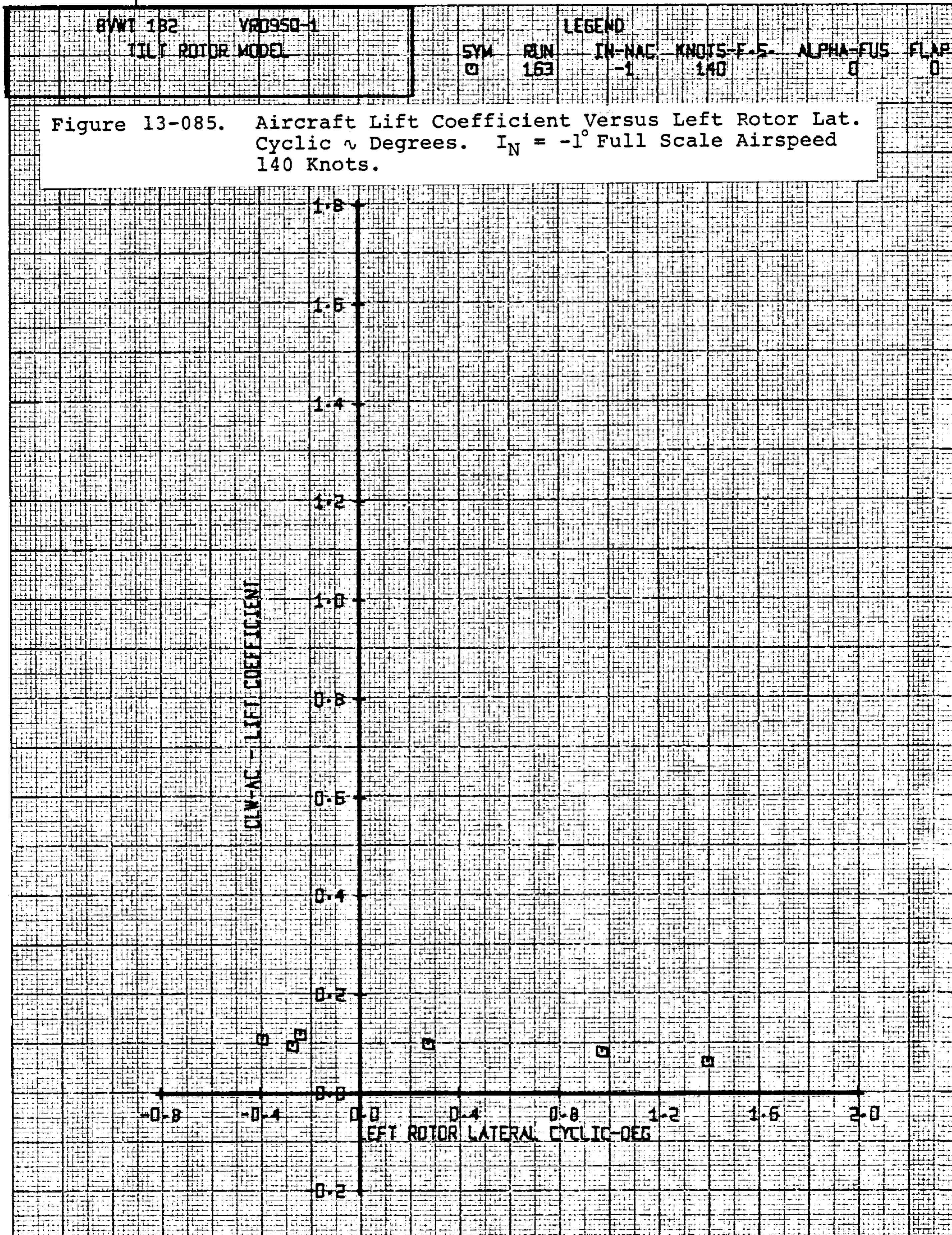


Figure 13-084. Right Rotor Yawing Moment Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

Figure 13-085. Aircraft Lift Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 140 Knots.



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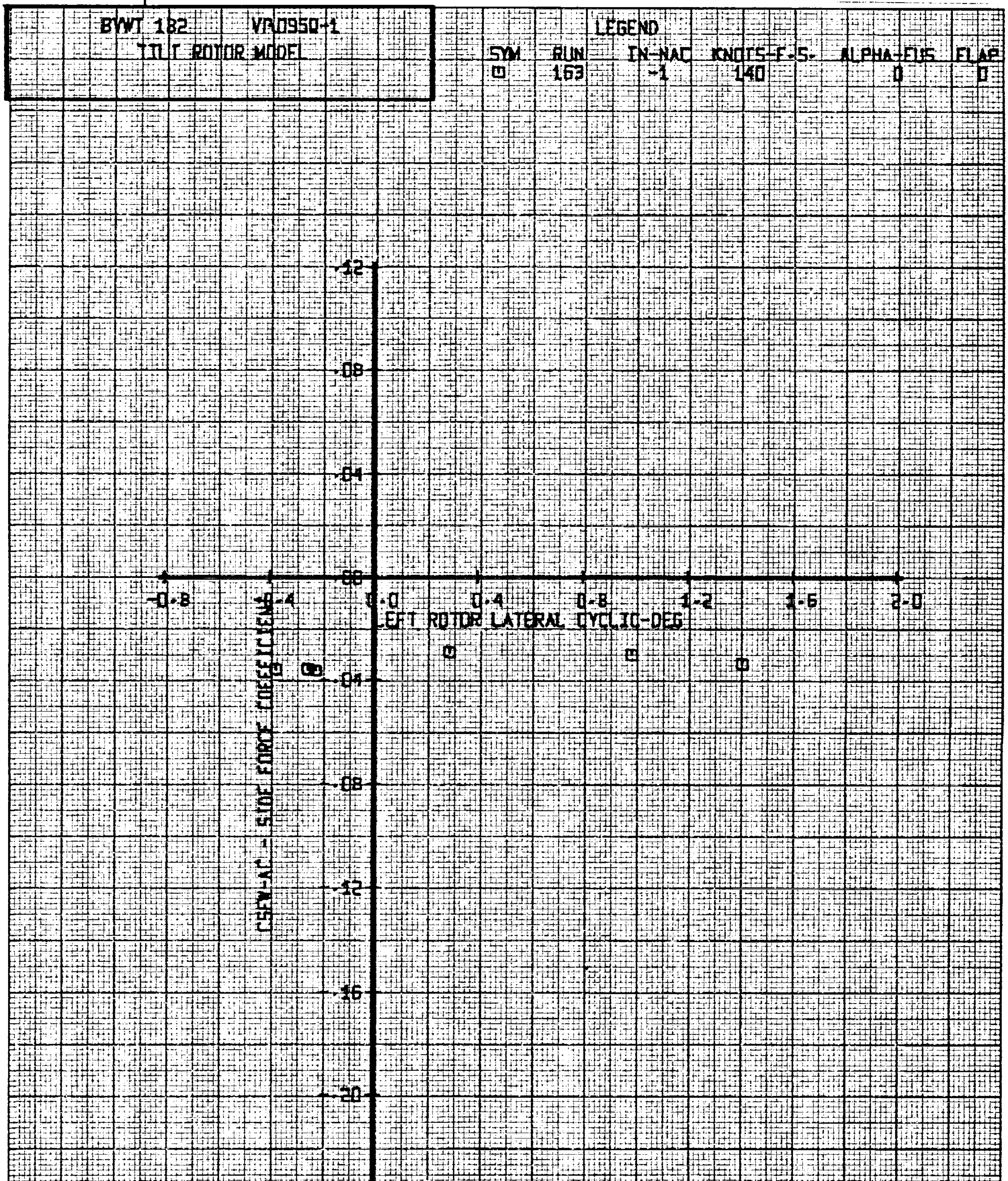

Figure 13-086. Aircraft Side Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

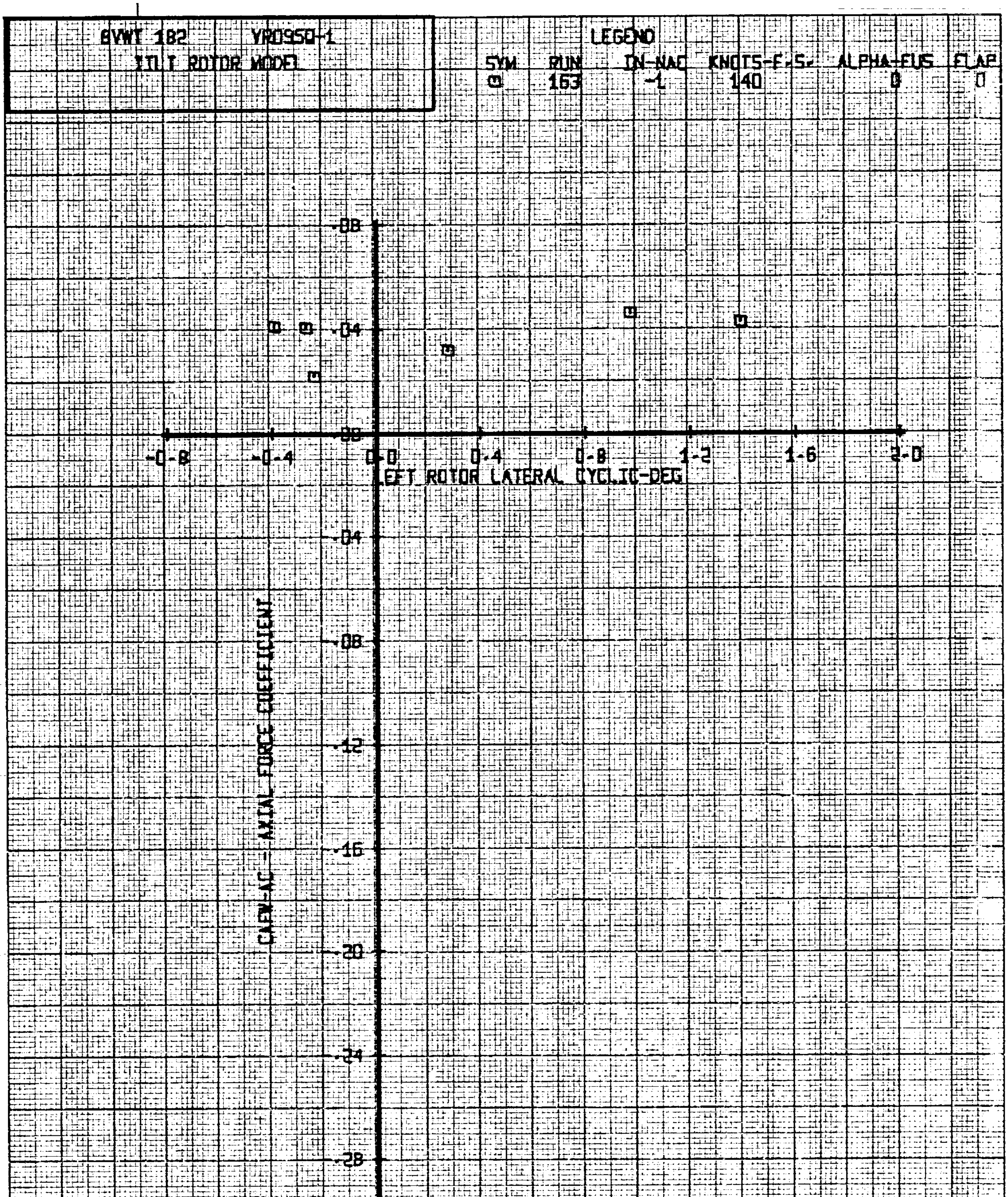

Figure 13-087. Aircraft Axial Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

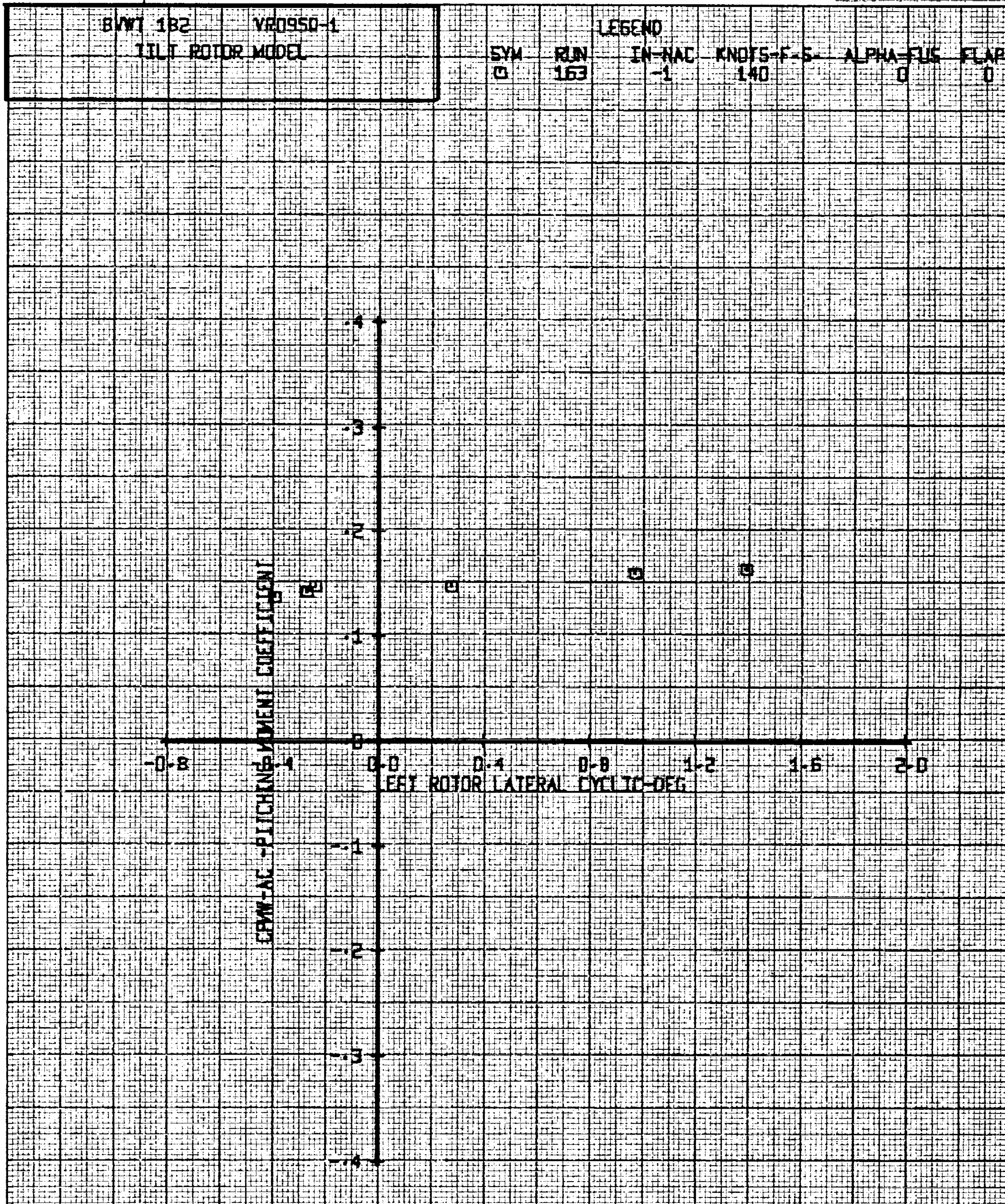

Figure 13-088. Aircraft Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1^\circ$ Full Scale Airspeed 140 Knots.

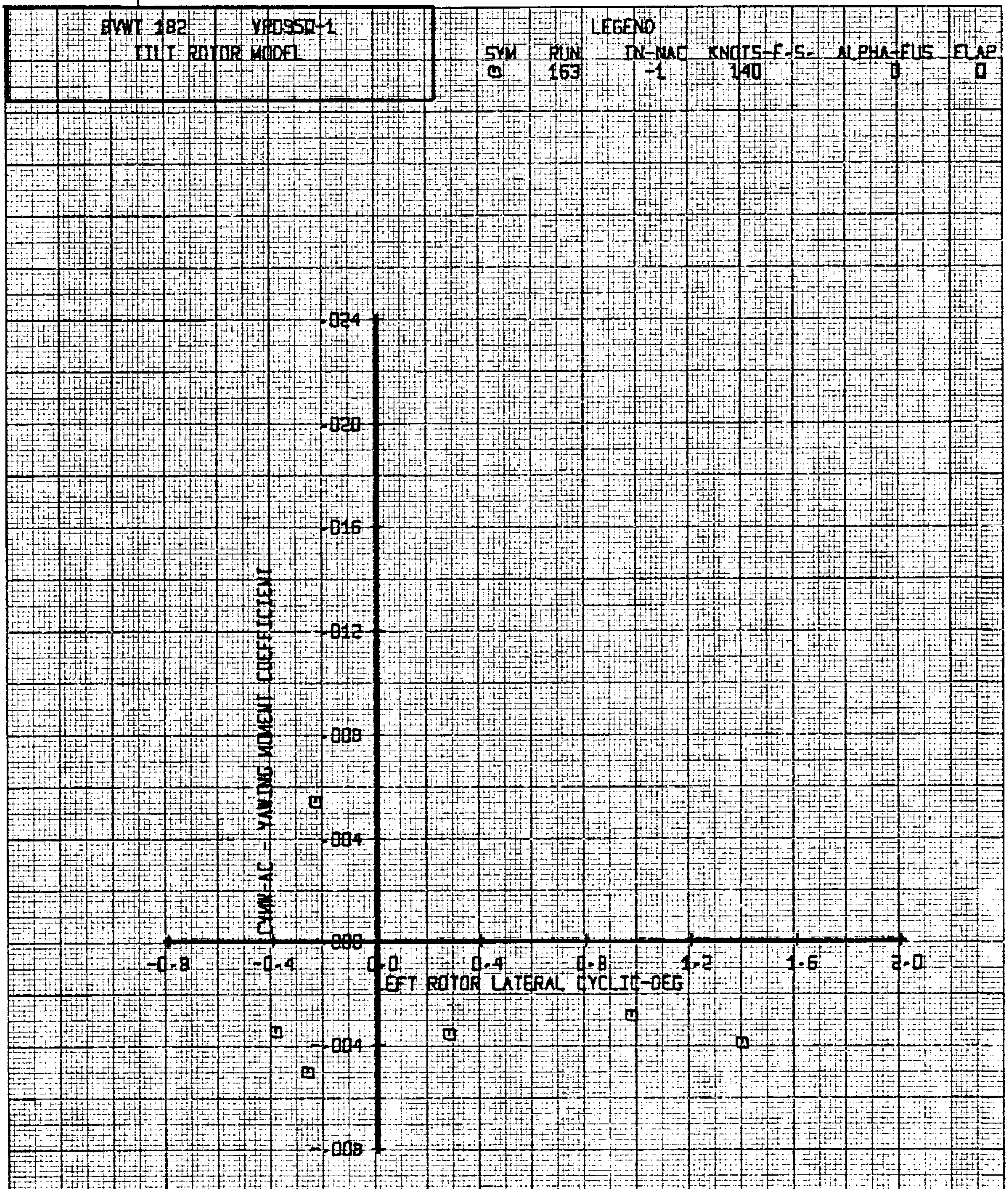

Figure 13-089. Aircraft Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

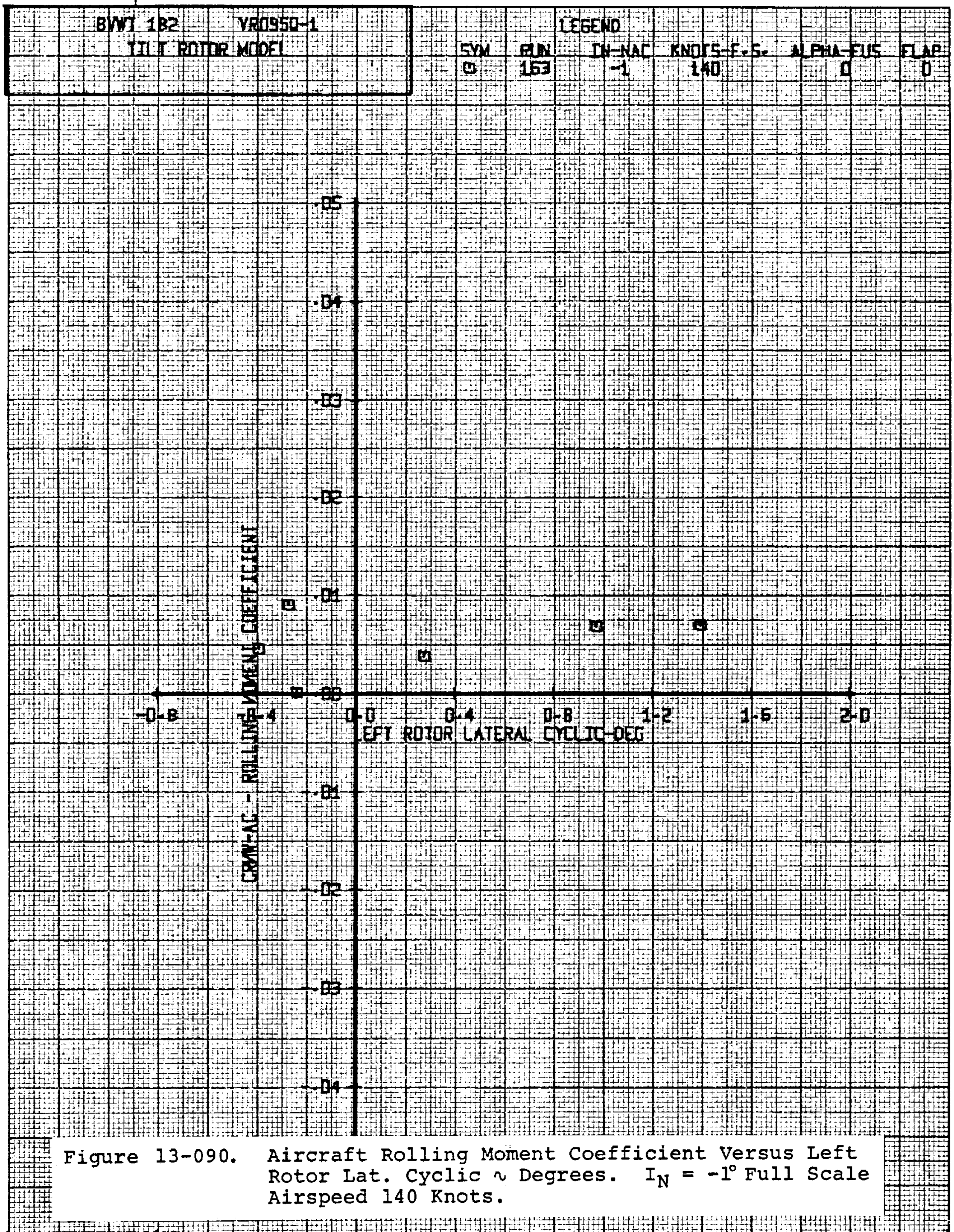

Figure 13-090. Aircraft Rolling Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

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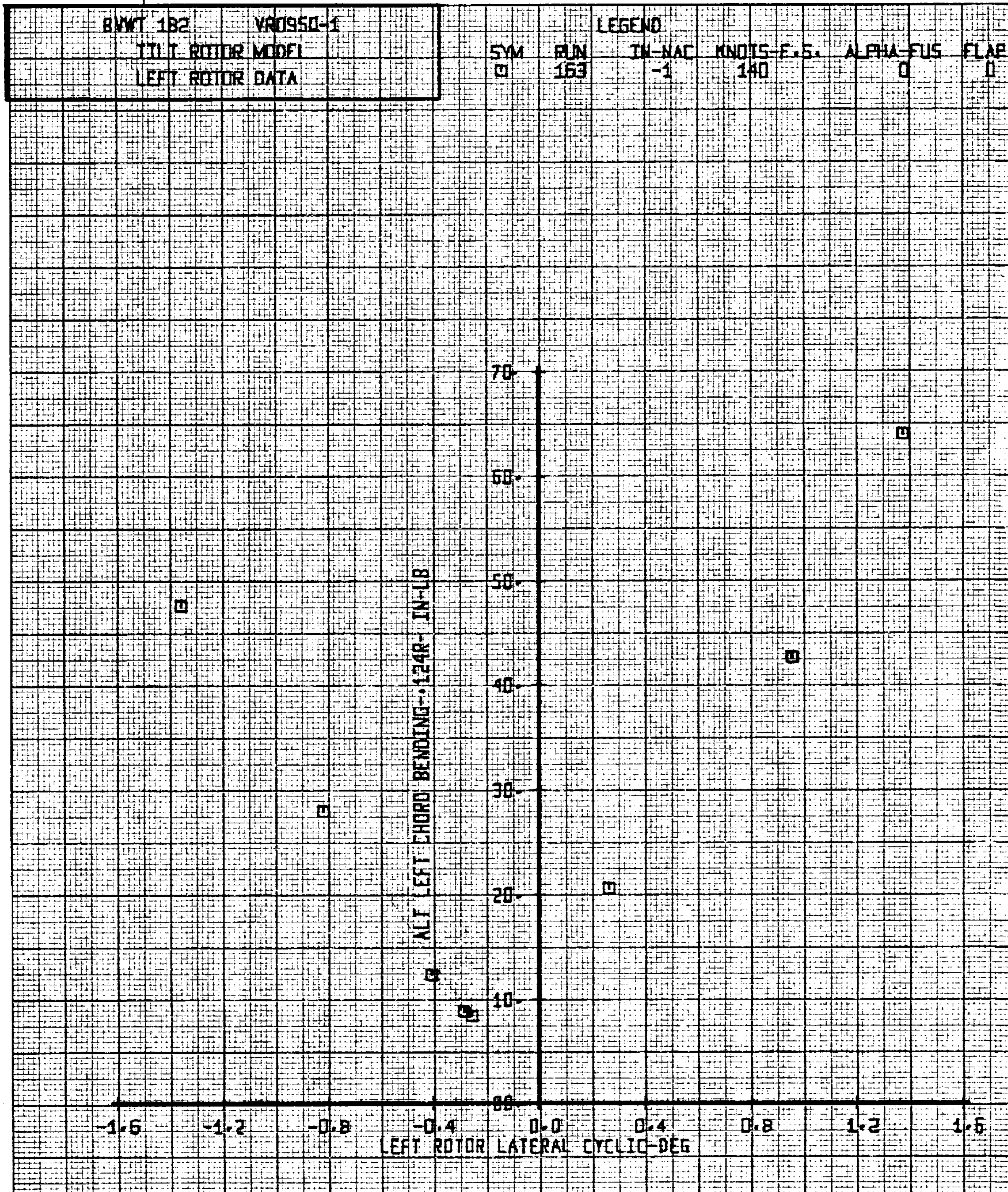
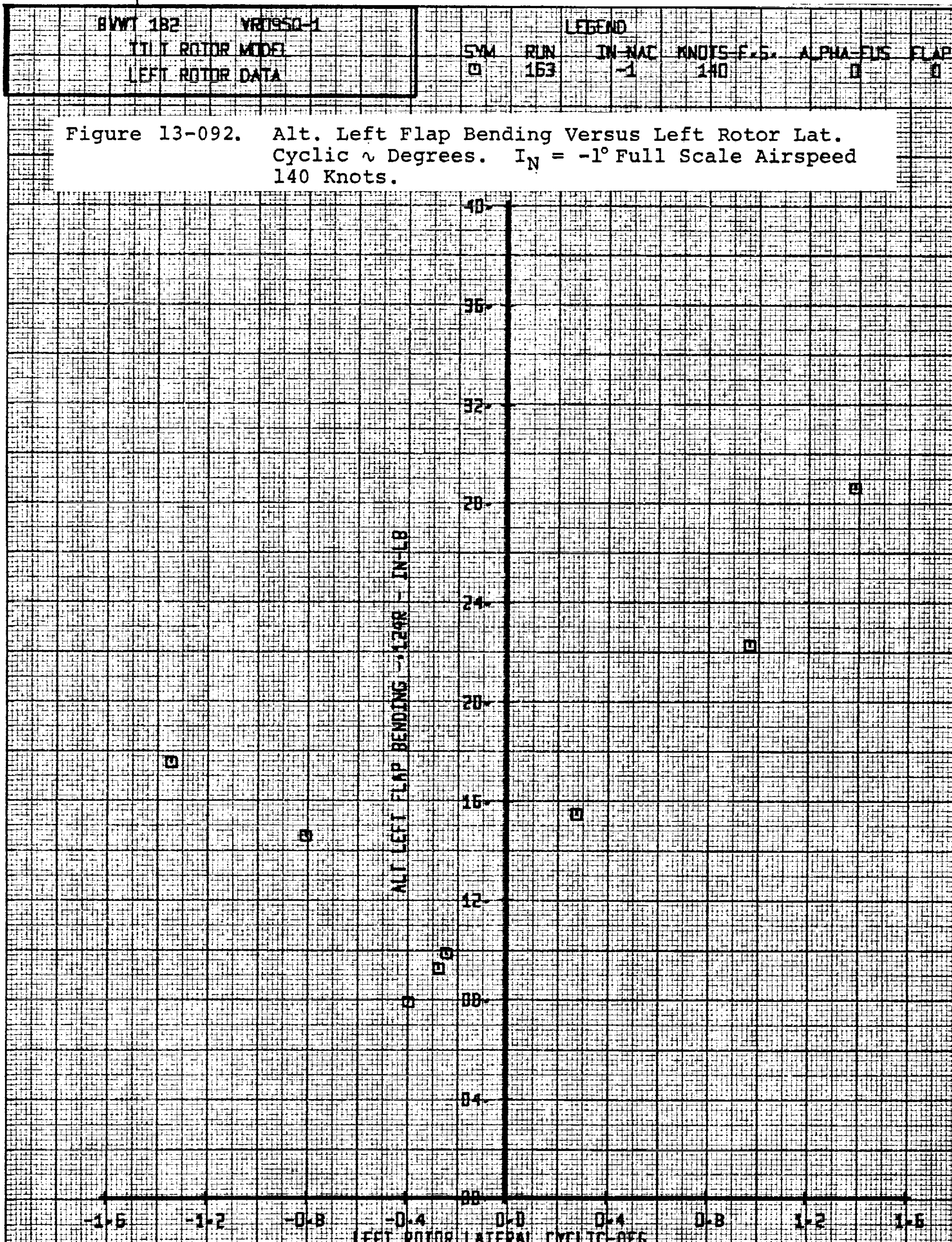


Figure 13-091. Alt. Left Chord Bending Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

Figure 13-092. Alt. Left Flap Bending Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.



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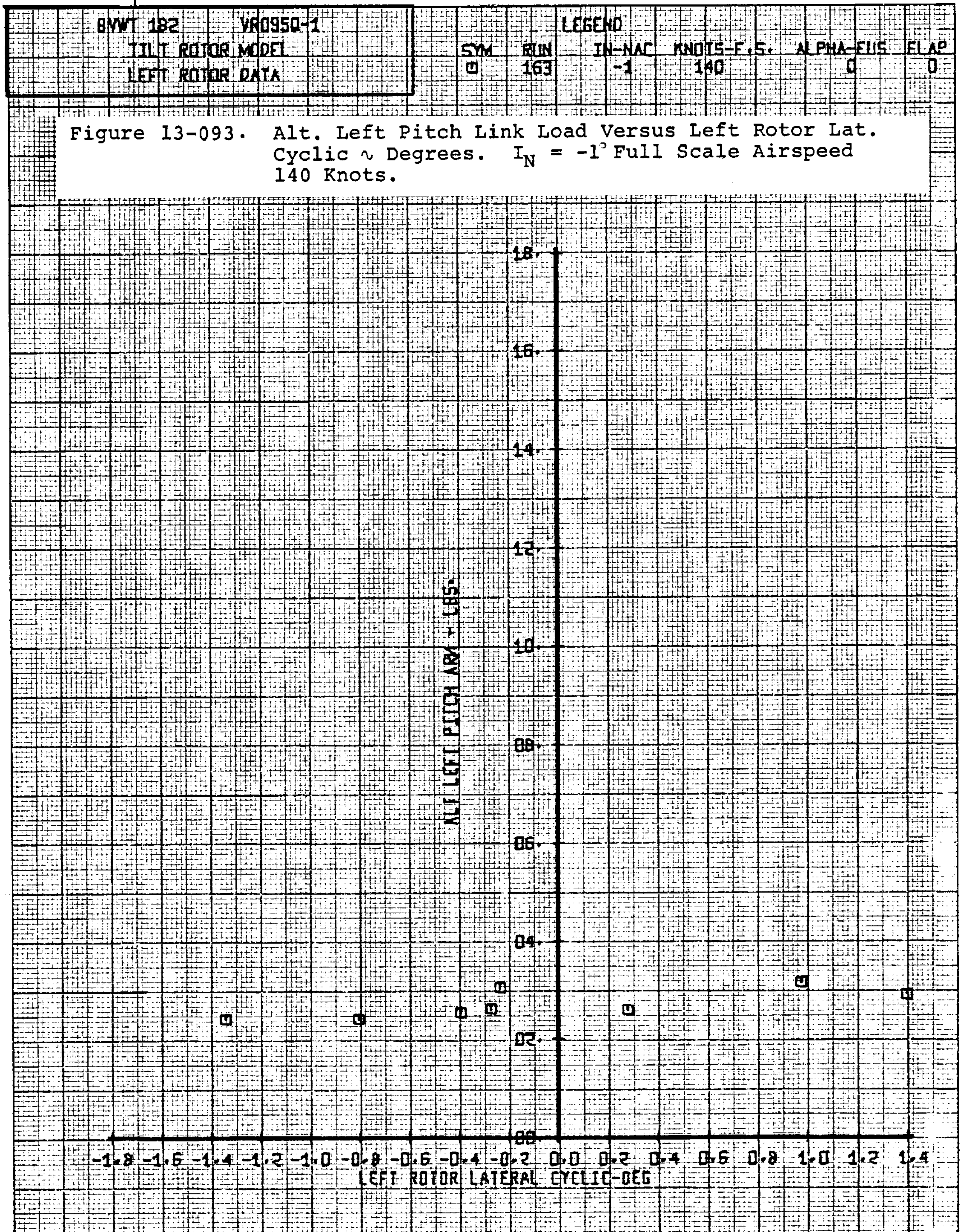

Figure 13-093. Alt. Left Pitch Link Load Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

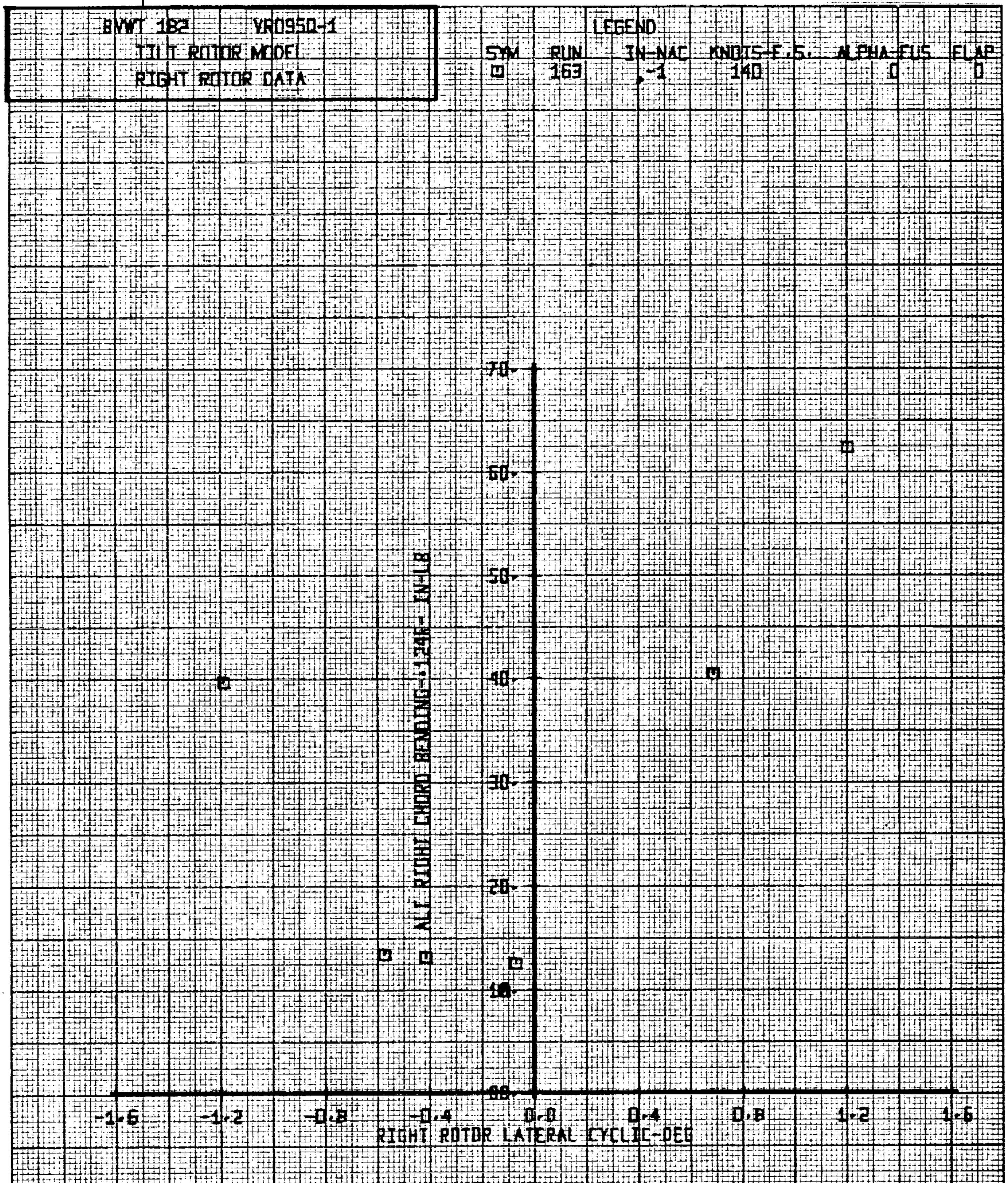

Figure 13-094. Alt. Right Chord Bending Versus Right Rotor Lat. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

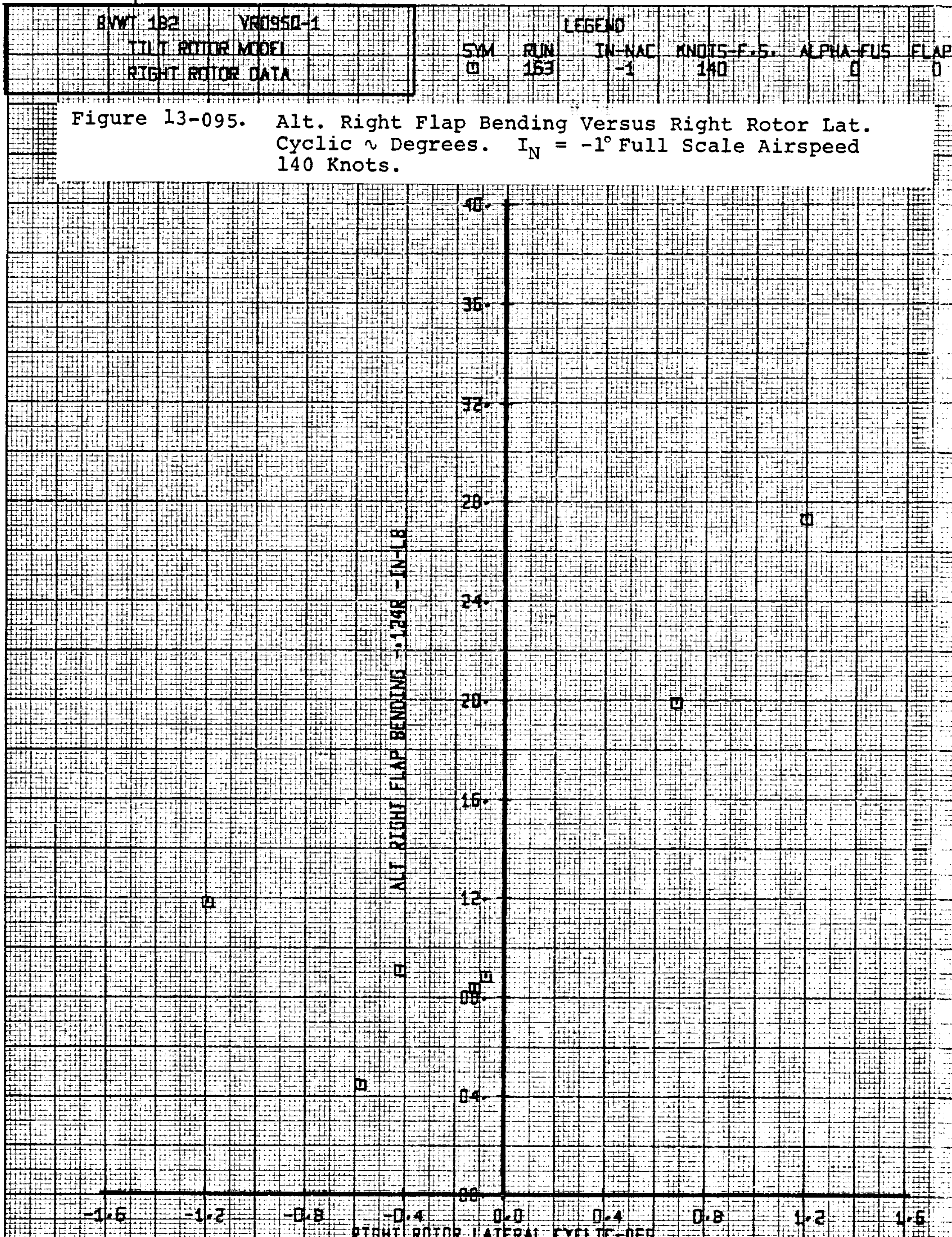

Figure 13-095. Alt. Right Flap Bending Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 140 Knots.

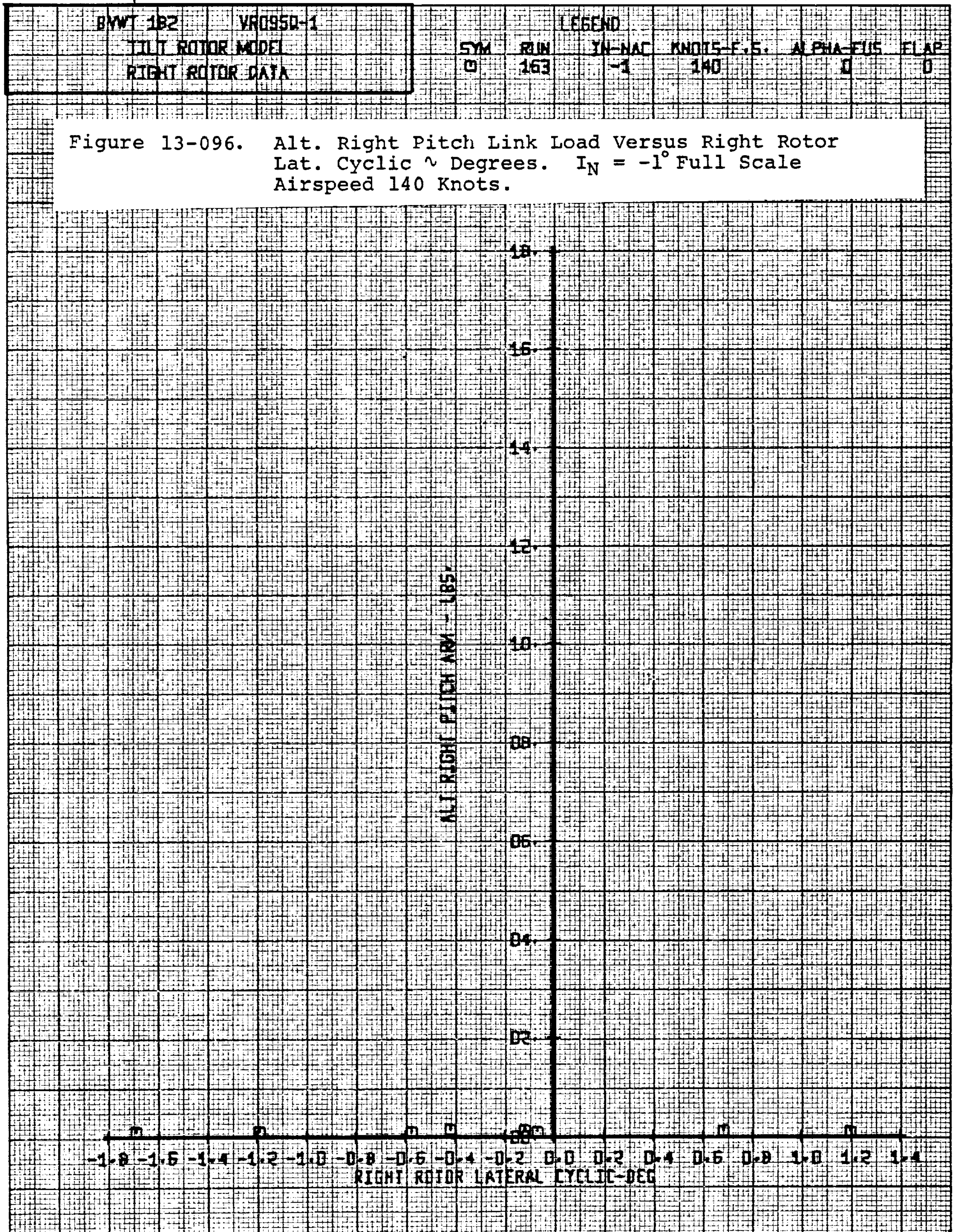

Figure 13-096. Alt. Right Pitch Link Load Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 140 Knots.

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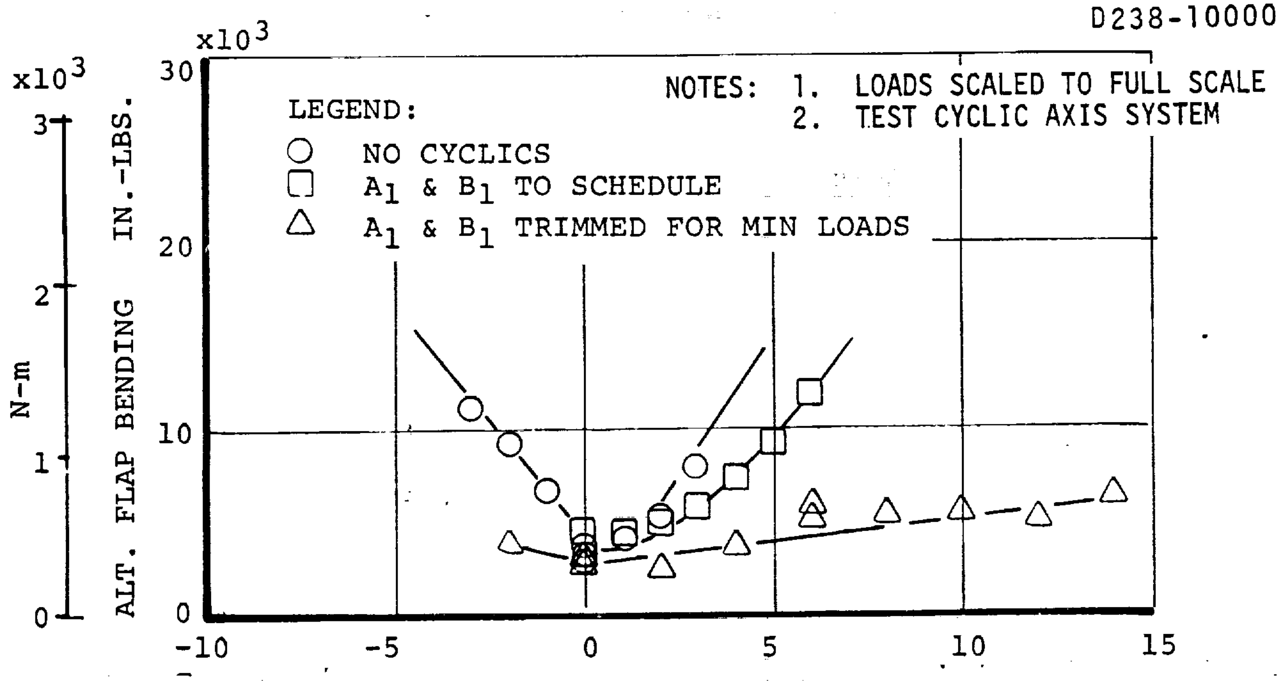


Figure 13-098. Alt. Left Rotor Blade Flap Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. $I_N = -1°$, V = 140 Knots.

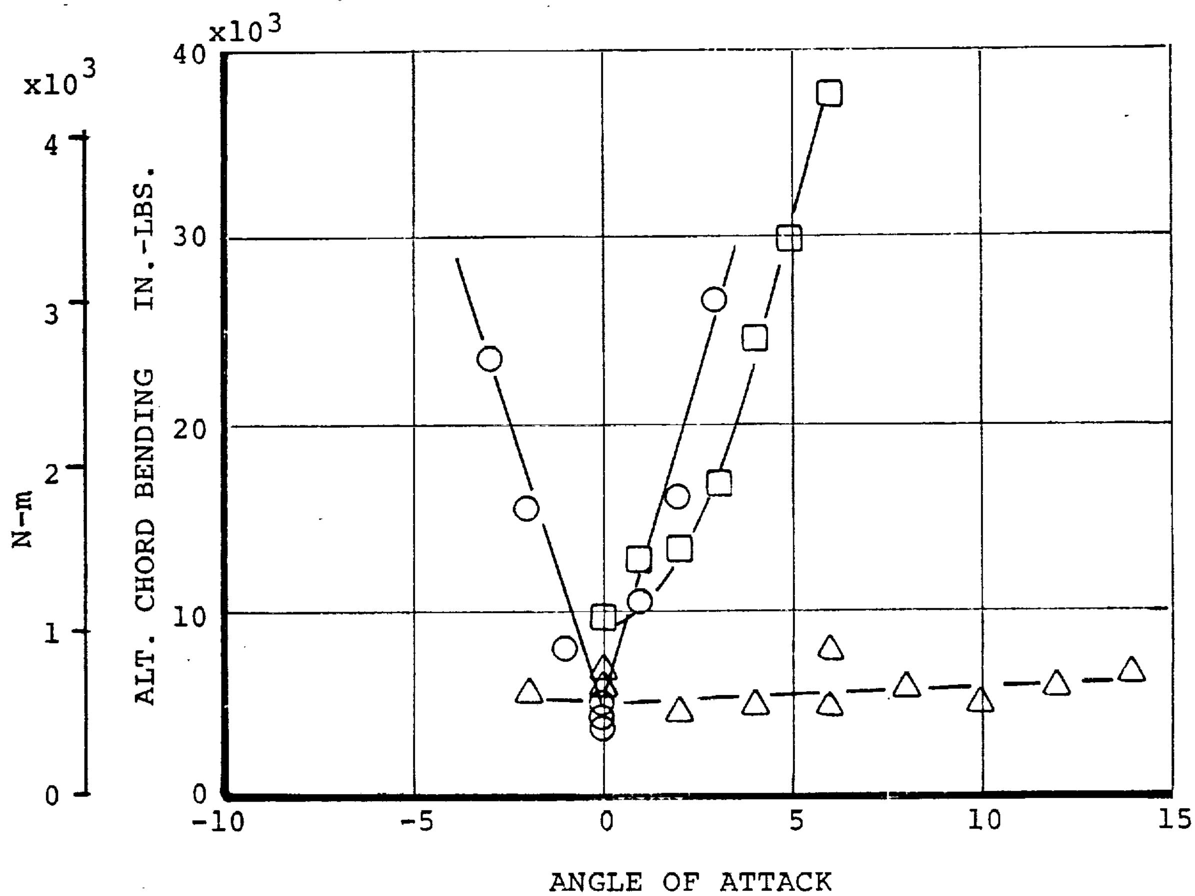
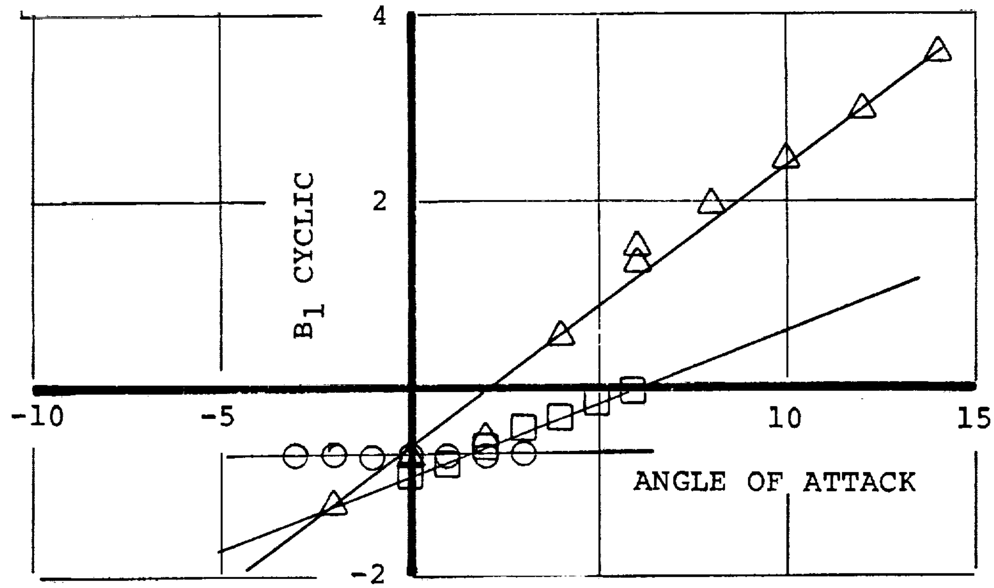


Figure 13-097. Alt. Left Rotor Blade Chord Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. $I_N = -1°$, V = 140 Knots.



LEGEND:

○ NO CYCLIC

□ A_1 & B_1 TO SCHEDULE

△ A_1 & B_1 TRIMMED FOR MIN LOADS

NOTES: 1. LOADS SCALED TO FULL SCALE
2. TEST CYCLIC AXIS SYSTEM

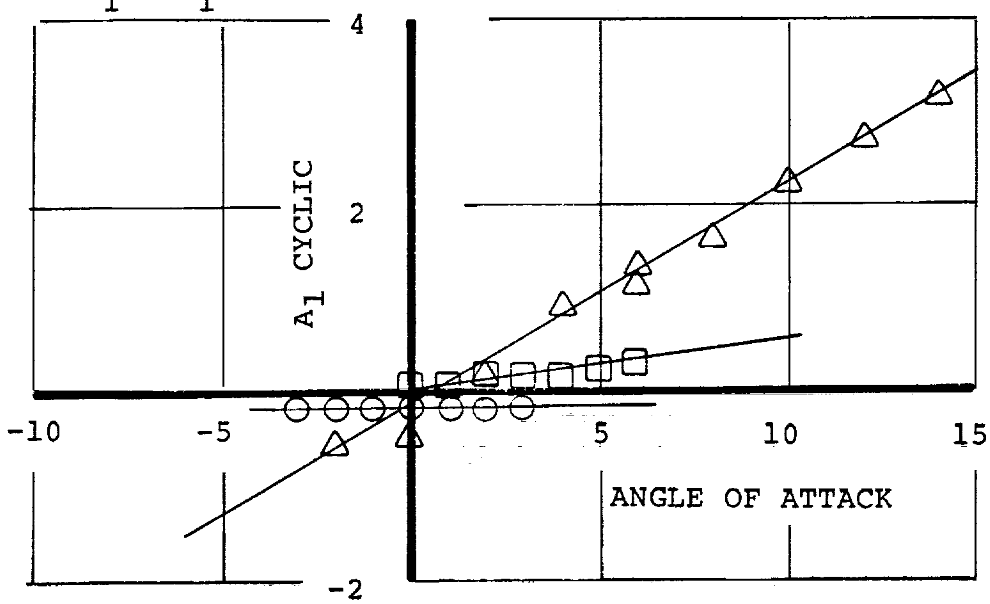


Figure 13-099. Left Rotor Cyclic Schedules. $I_N = -1^\circ$, V = 140 Knots.

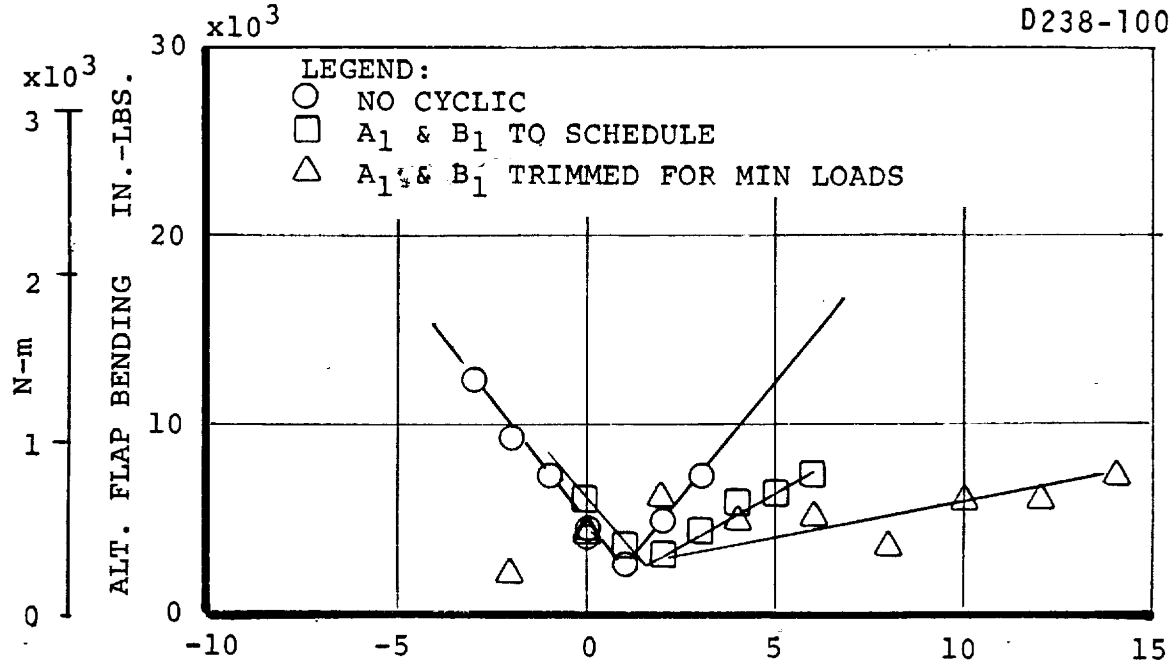


Figure 13-101. Alt. Right Rotor Blade Flap Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. $I_N = -1°$, V = 140 Knots.

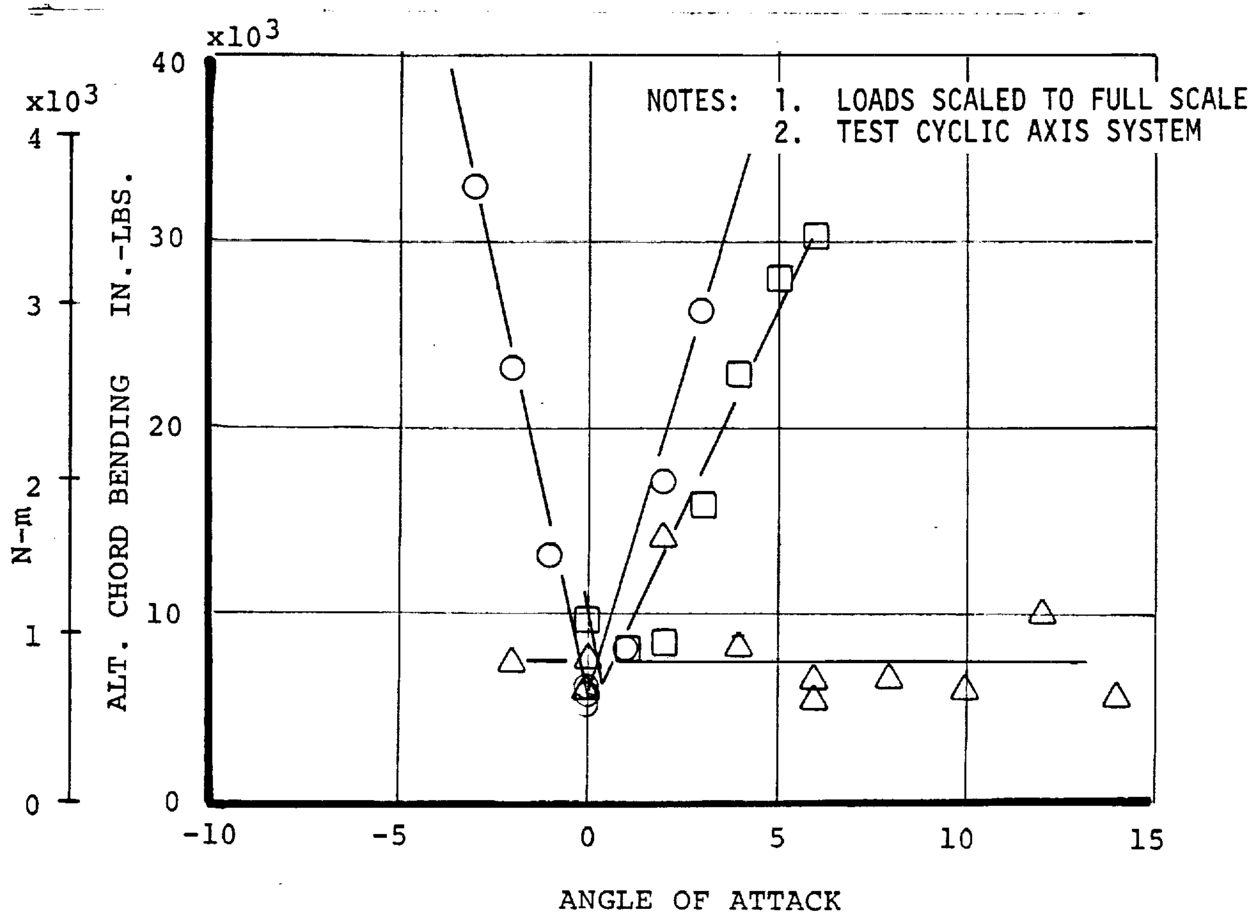


Figure 13-100. Alt. Right Rotor Blade Chord Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. $I_N = -1°$, V = 140 Knots.

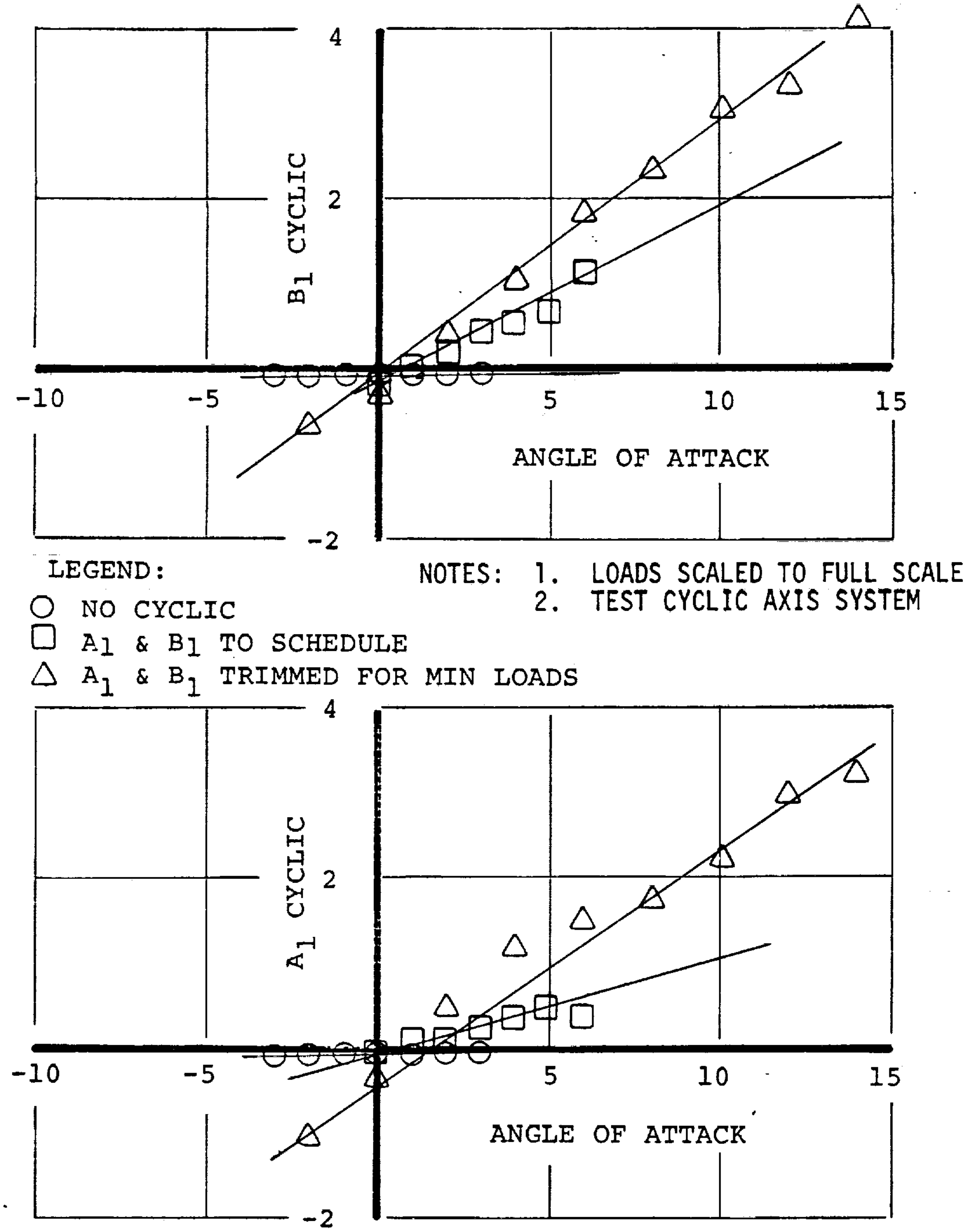


Figure 13-102. Right Rotor Cyclic Schedules. $I_N = -1^\circ$, V = 140 Knots.

$I_N = -1^{\circ}$ $V_{FS} = 180$ KTS.

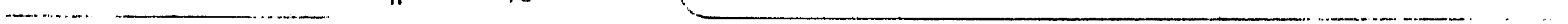
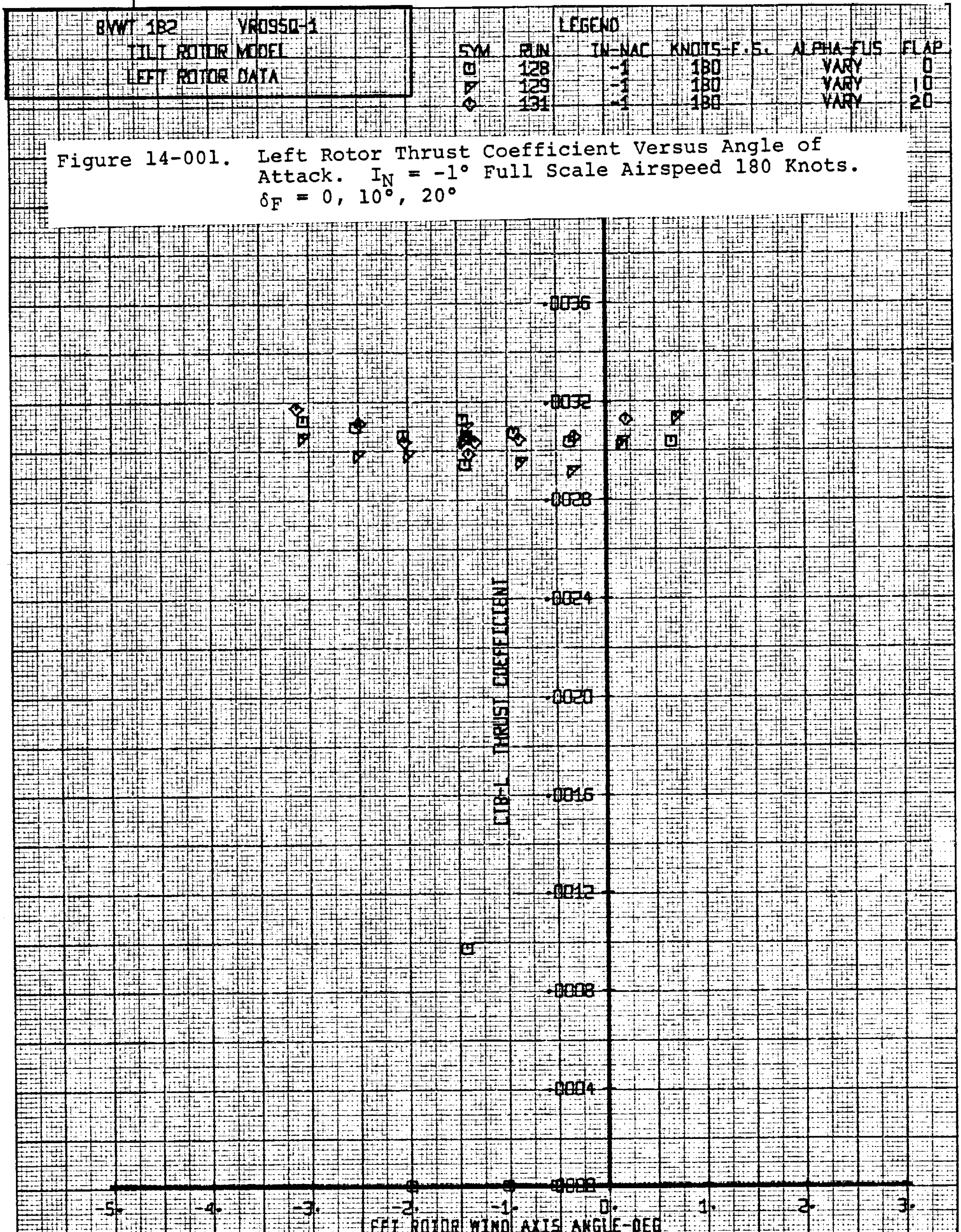


Figure 14-001. Left Rotor Thrust Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. $\delta_F = 0, 10°, 20°$



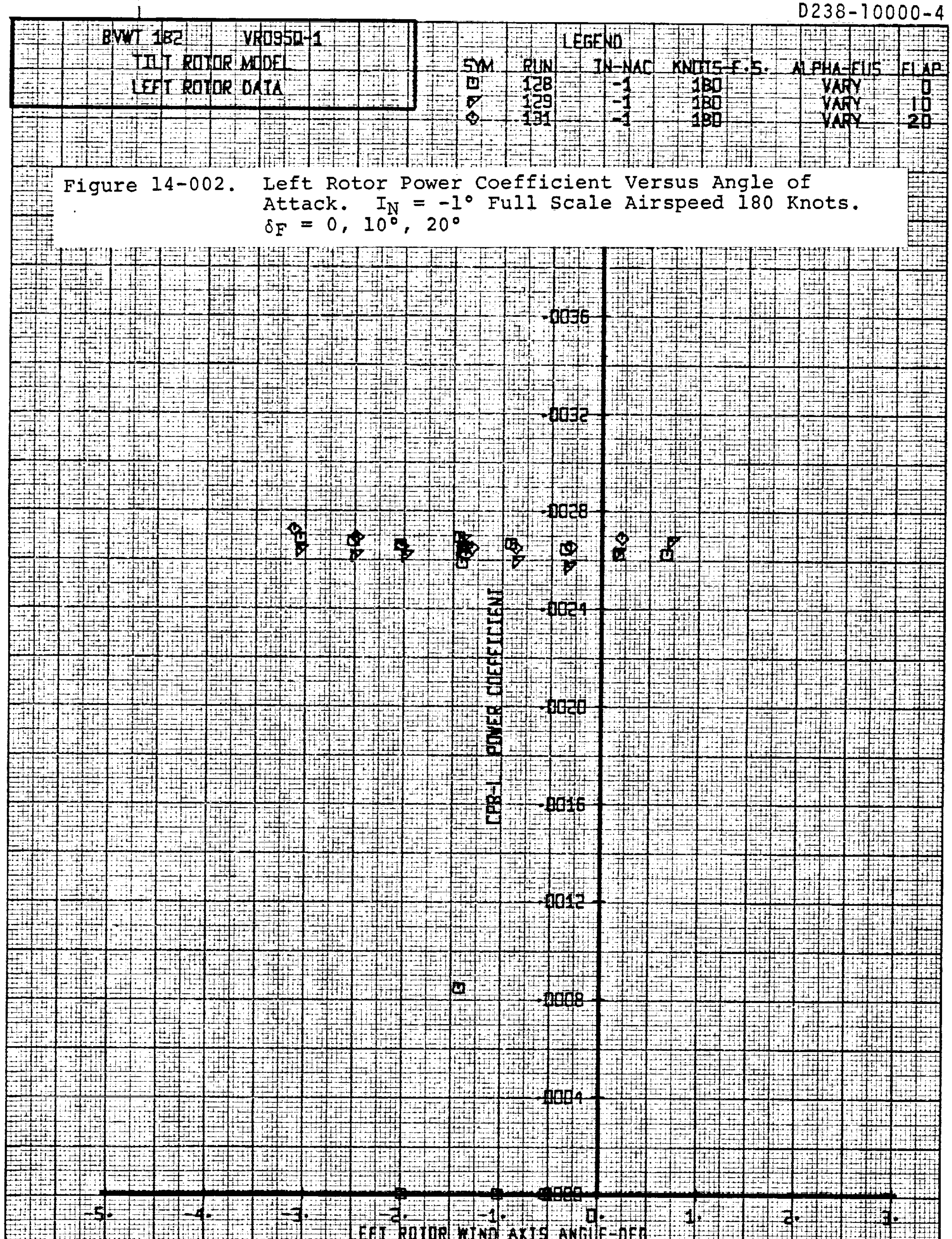


Figure 14-002. Left Rotor Power Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. $\delta_F = 0, 10°, 20°$

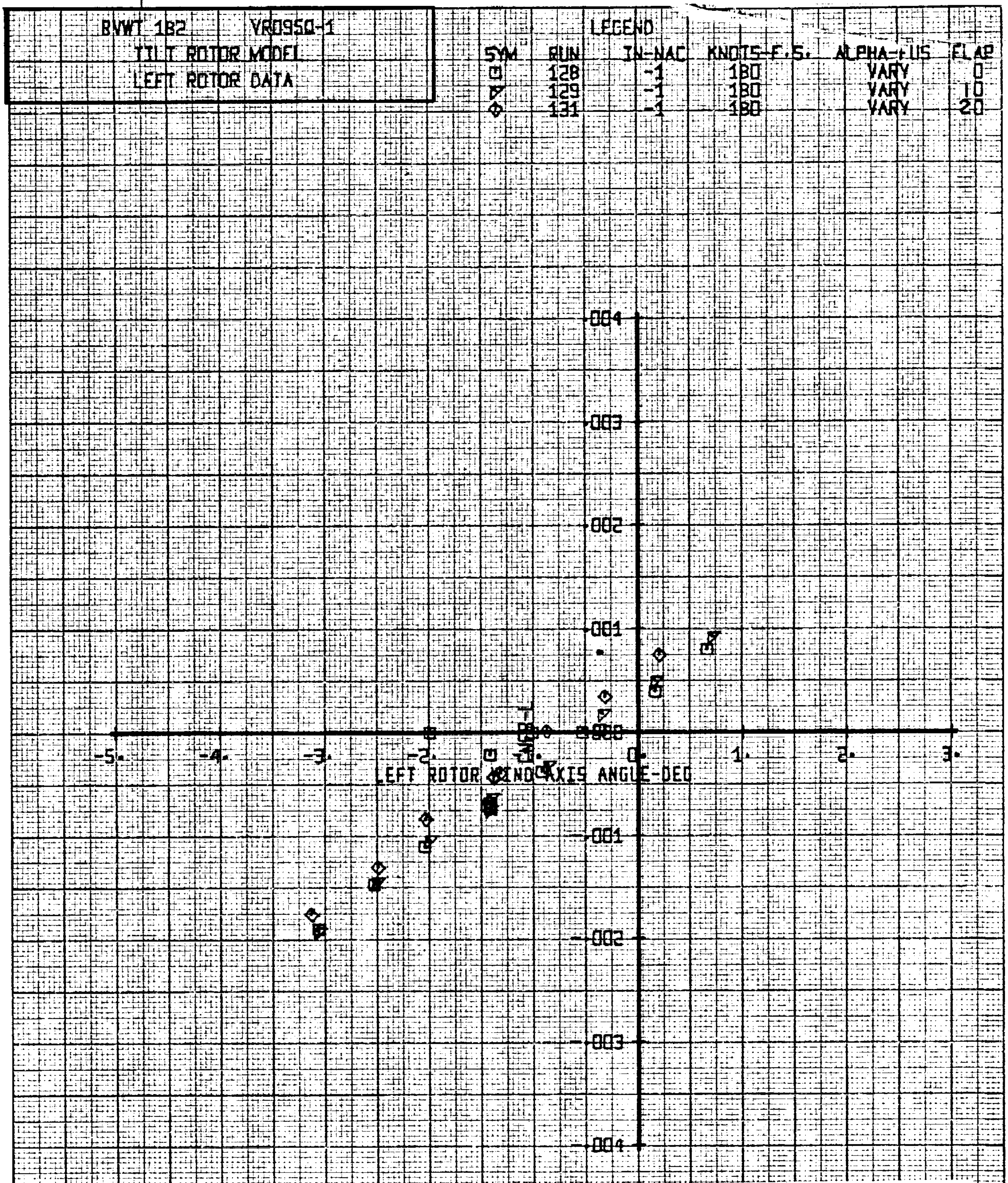


Figure 14-003. Left Rotor Normal Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. δ_N = 0, 10°, 20°

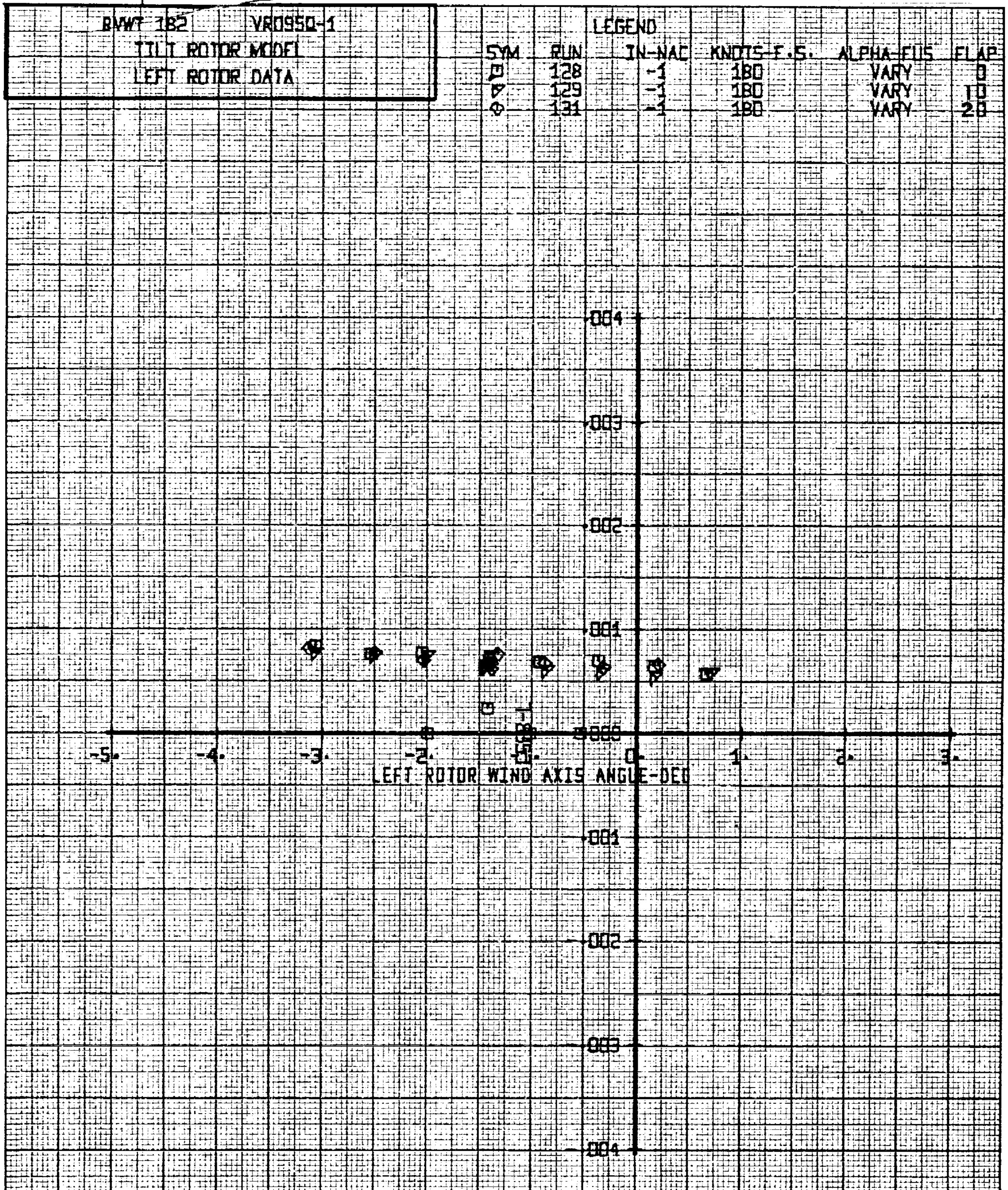


Figure 14-004. Left Rotor Side Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. $\delta_F = 0, 10°, 20°$

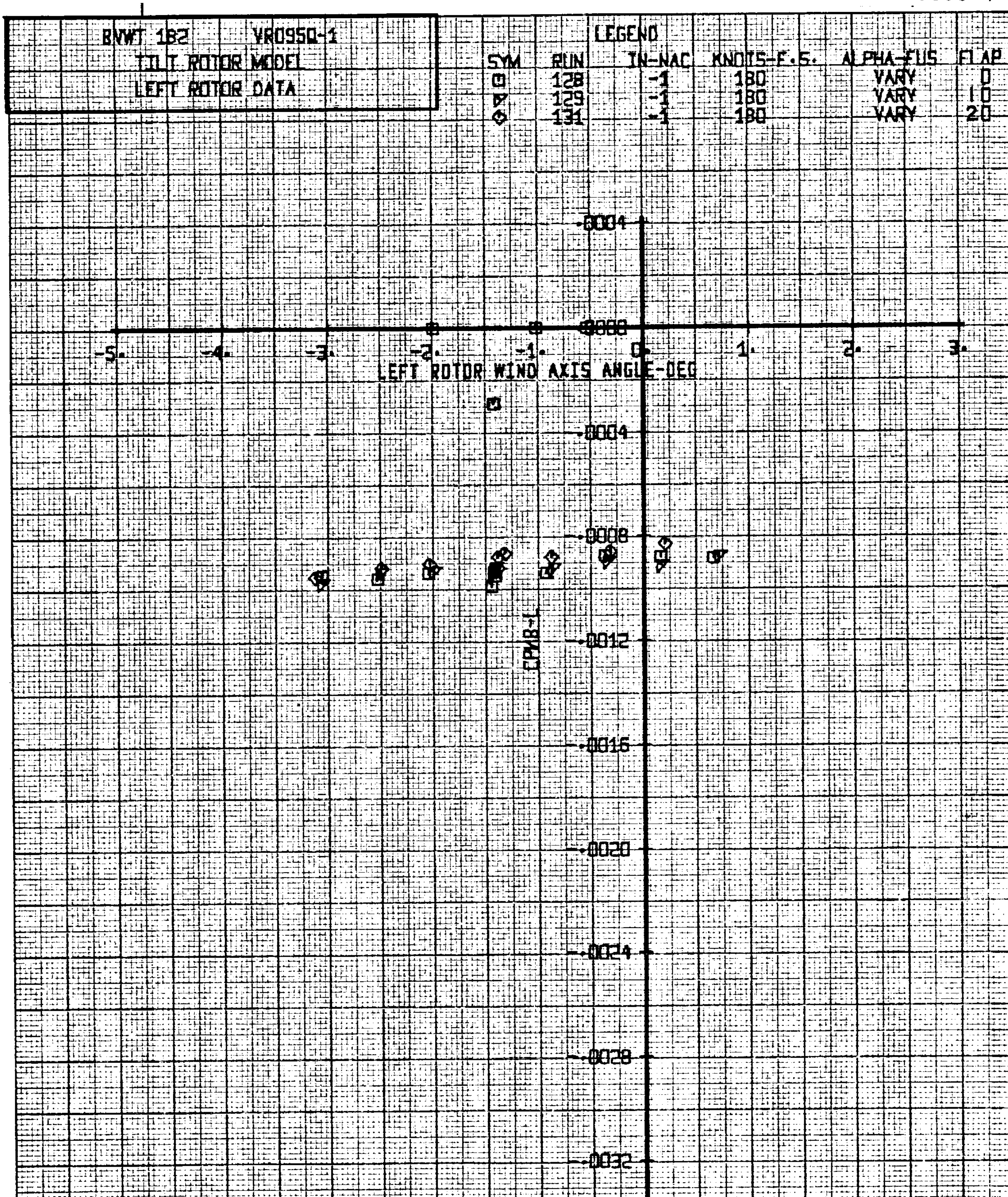


Figure 14-005. Left Rotor Pitching Moment Versus Angle of Attack.
I_N = -1° Full Scale Airspeed 180 Knots.
δ_F = 0, 10°, 20°

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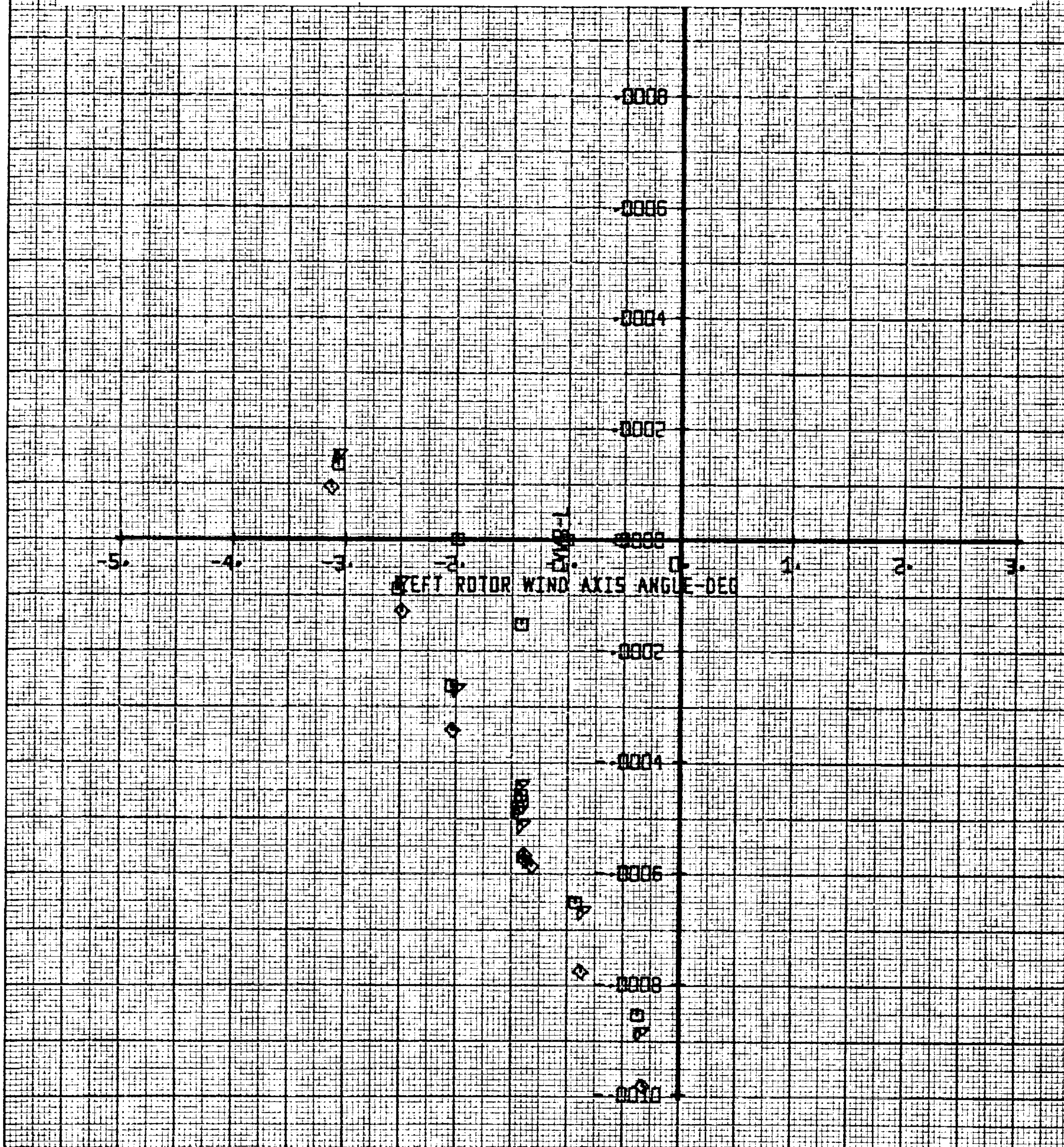
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
□	128	-1	180	VARY	0
▽	129	-1	180	VARY	10
◇	131	-1	180	VARY	20

Figure 14-006. Left Rotor Yawing Moment Versus Angle of Attack. I_N = -1° Full Scale Airspeed 180 Knots. δ_F = 0, 10°, 20°



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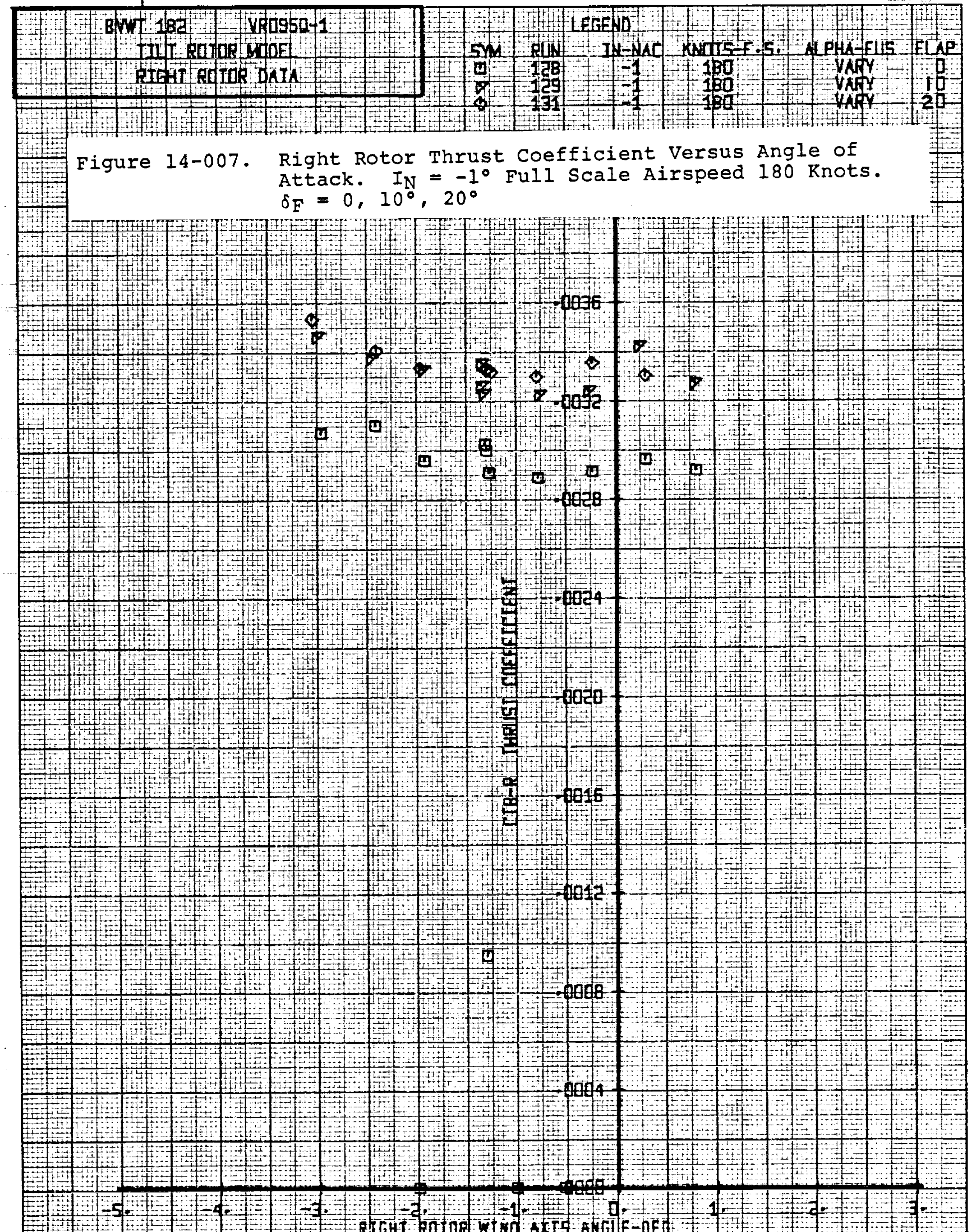

Figure 14-007. Right Rotor Thrust Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. $\delta_F = 0, 10°, 20°$

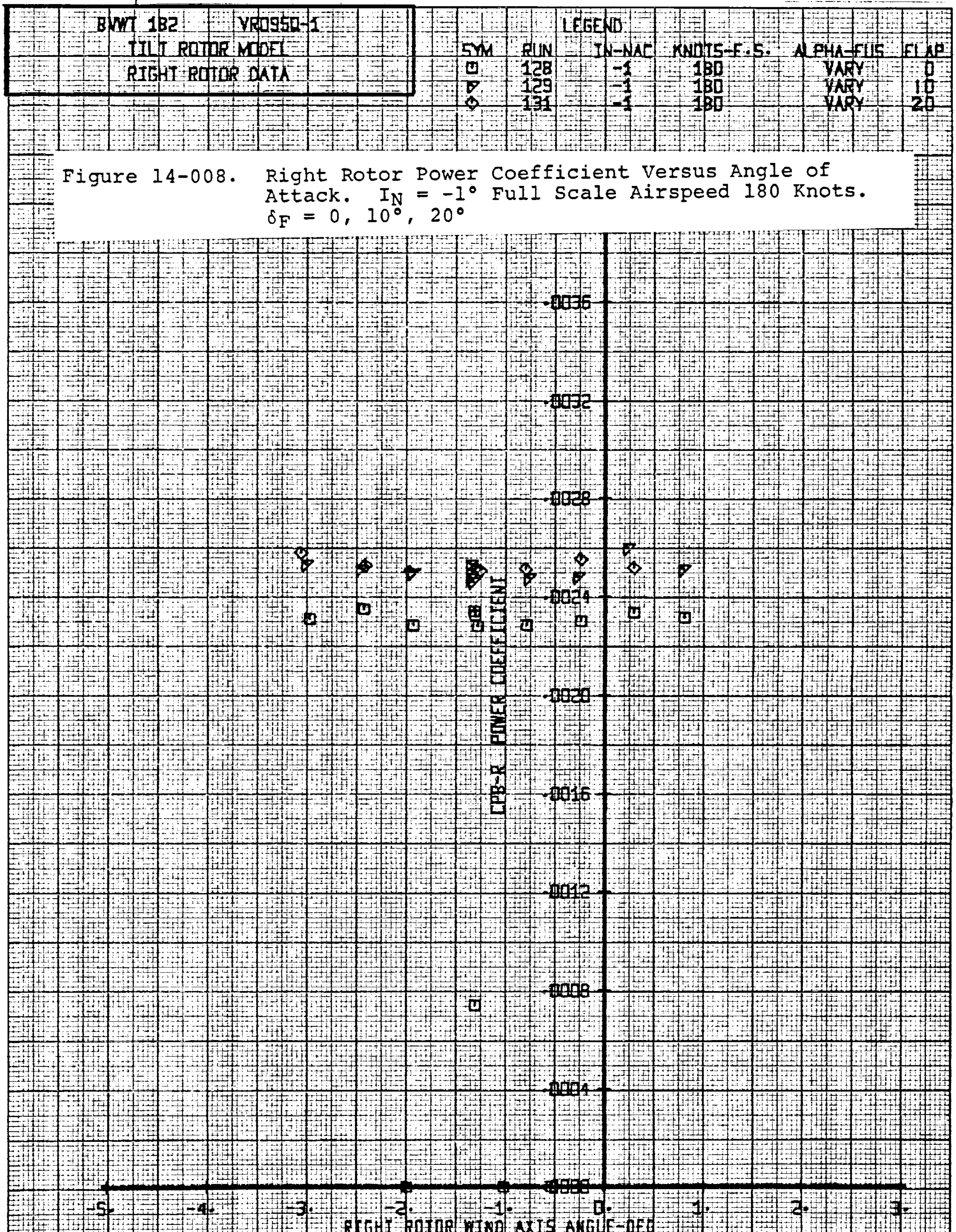

Figure 14-008. Right Rotor Power Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. δ_F = 0, 10°, 20°

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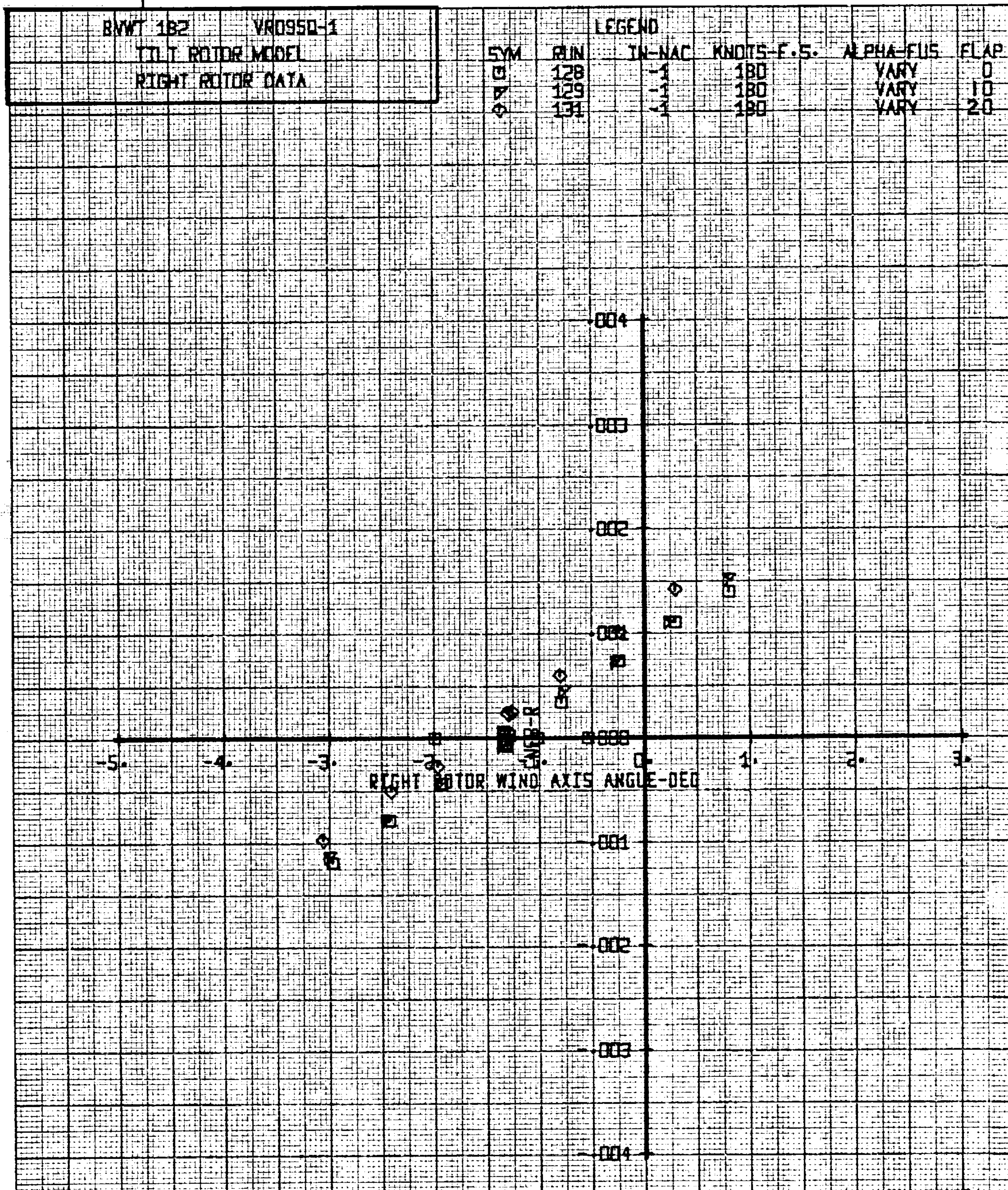


Figure 14-009. Right Rotor Normal Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. $\delta_F = 0, 10°, 20°$

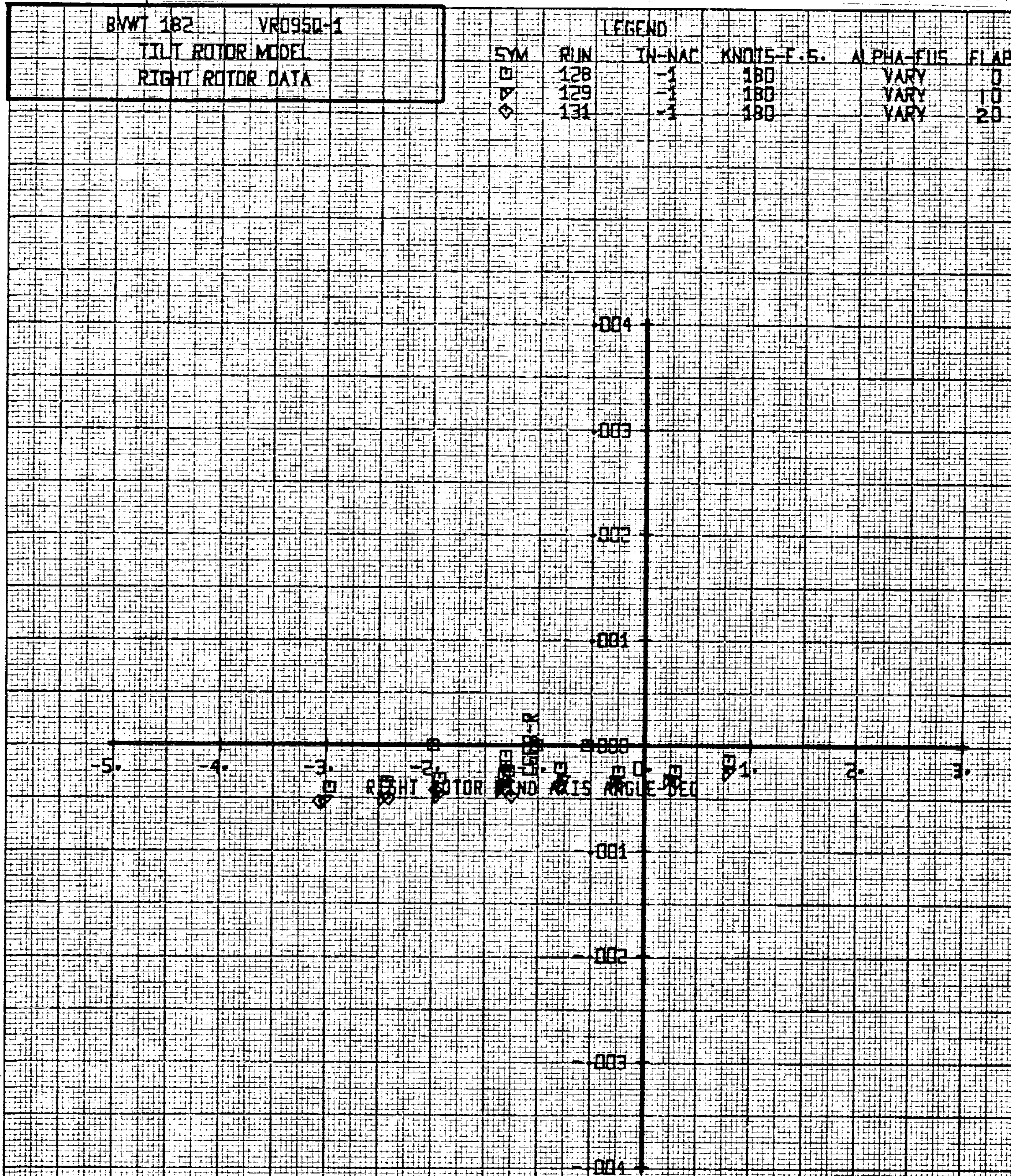


Figure 14-010. Right Rotor Side Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. $\delta_F = 0, 10°, 20°$

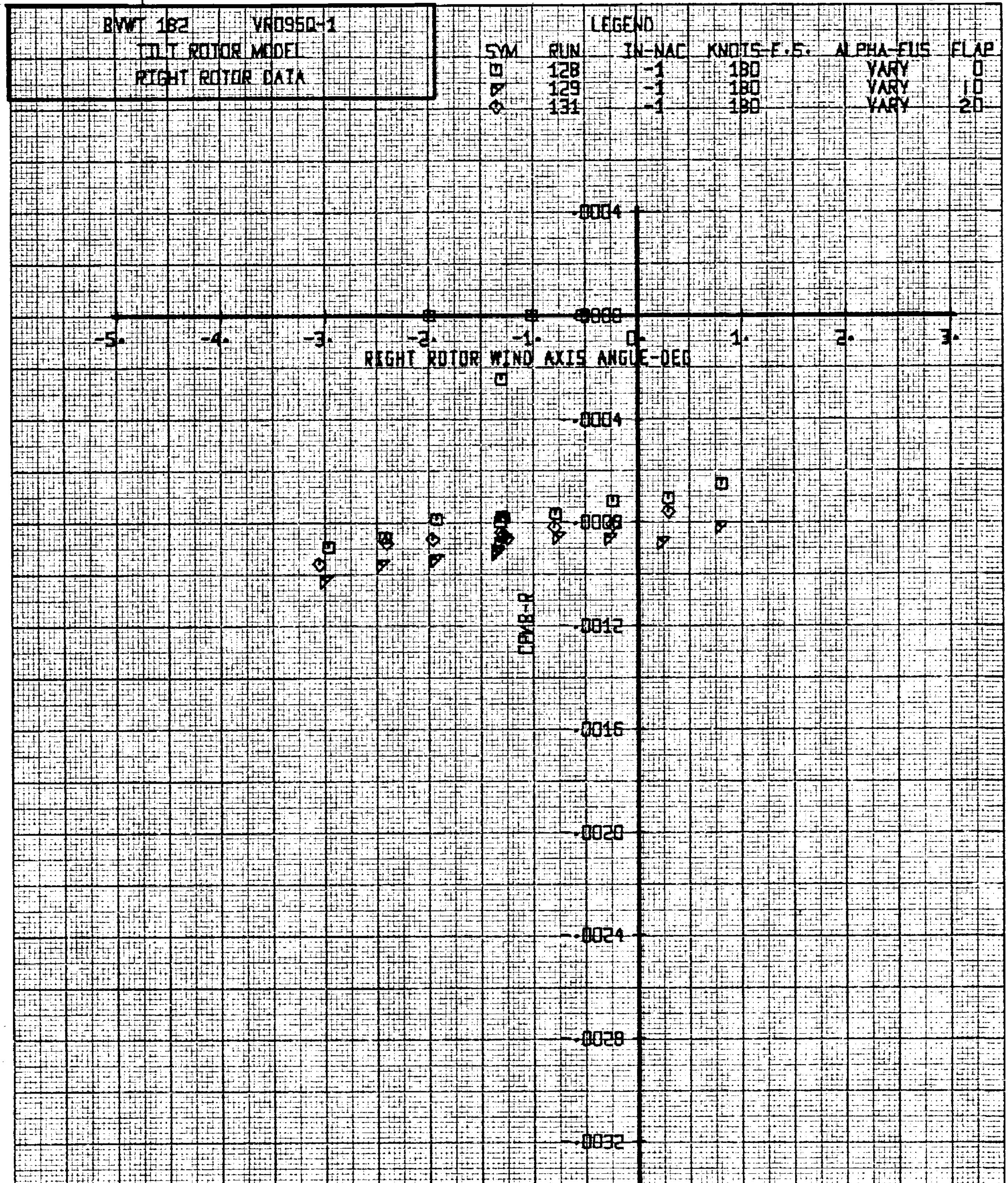


Figure 14-011. Right Rotor Pitching Moment Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. $\delta_F = 0, 10°, 20°$

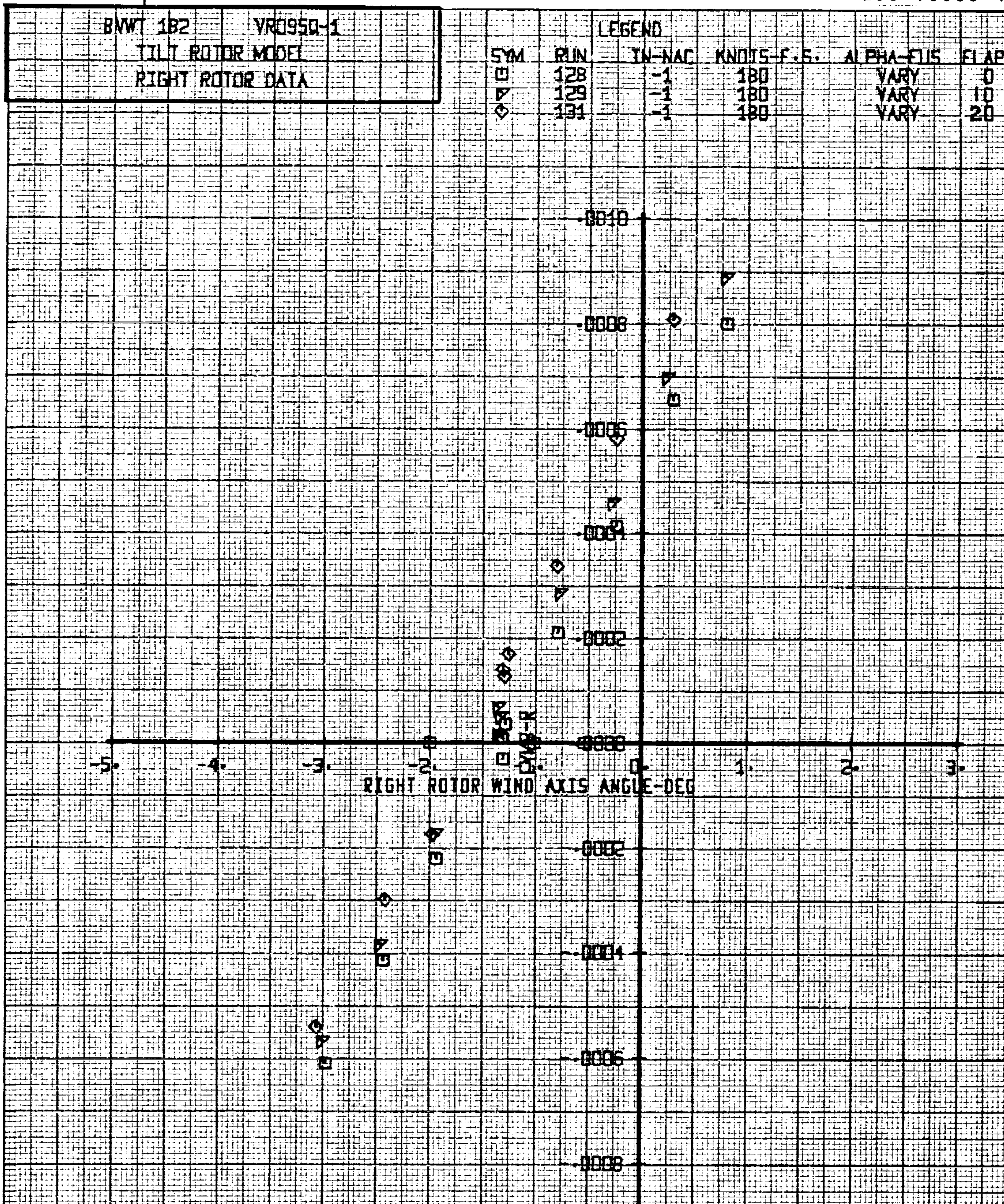
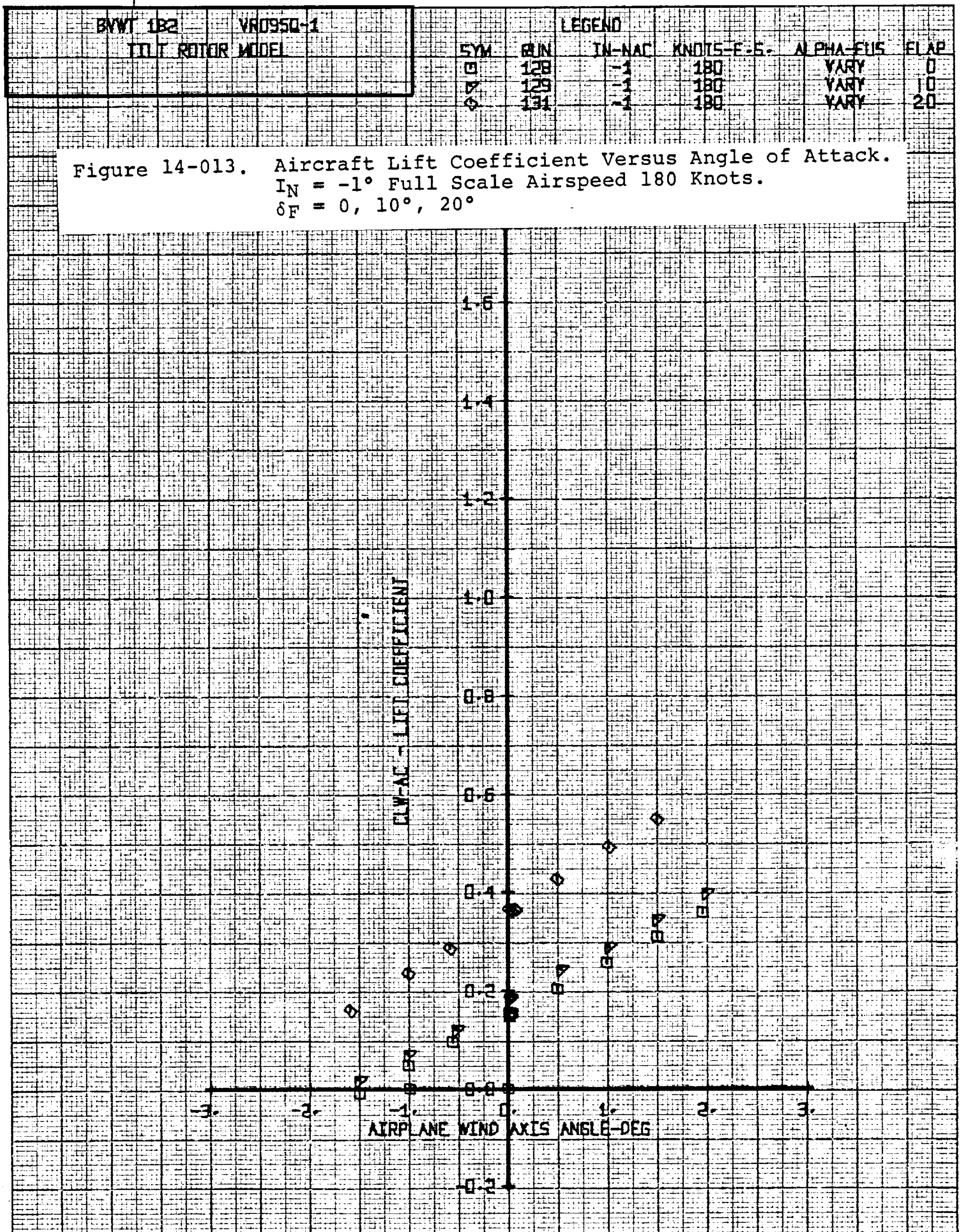


Figure 14-012. Right Rotor Yawing Moment Versus Angle of Attack.
$I_N = -1°$ Full Scale Airspeed 180 Knots.
$\delta_F = 0, 10°, 20°$

Figure 14-013. Aircraft Lift Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. $\delta_F = 0, 10°, 20°$



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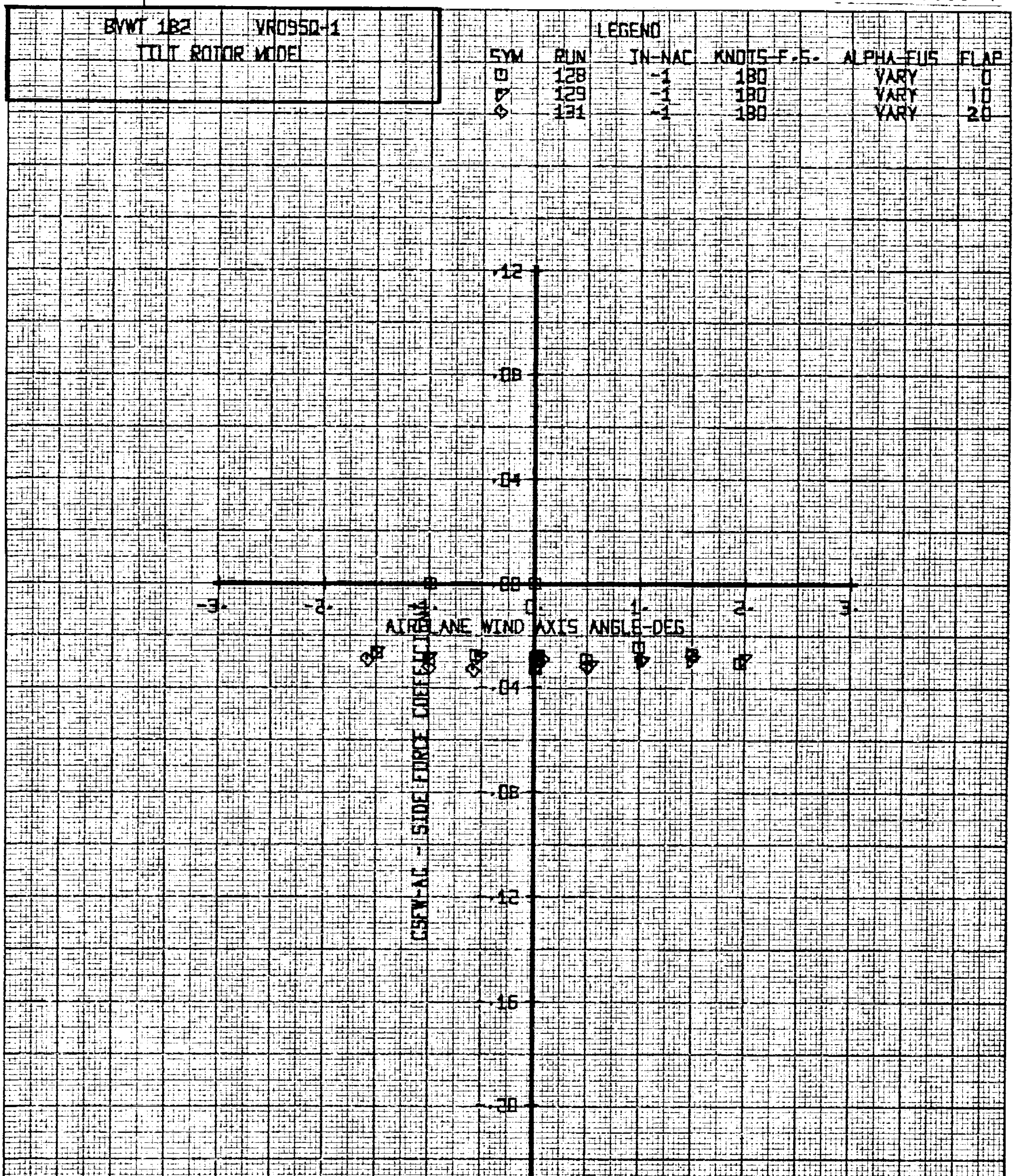


Figure 14-014. Aircraft Side Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. $\delta_F = 0, 10°, 20°$

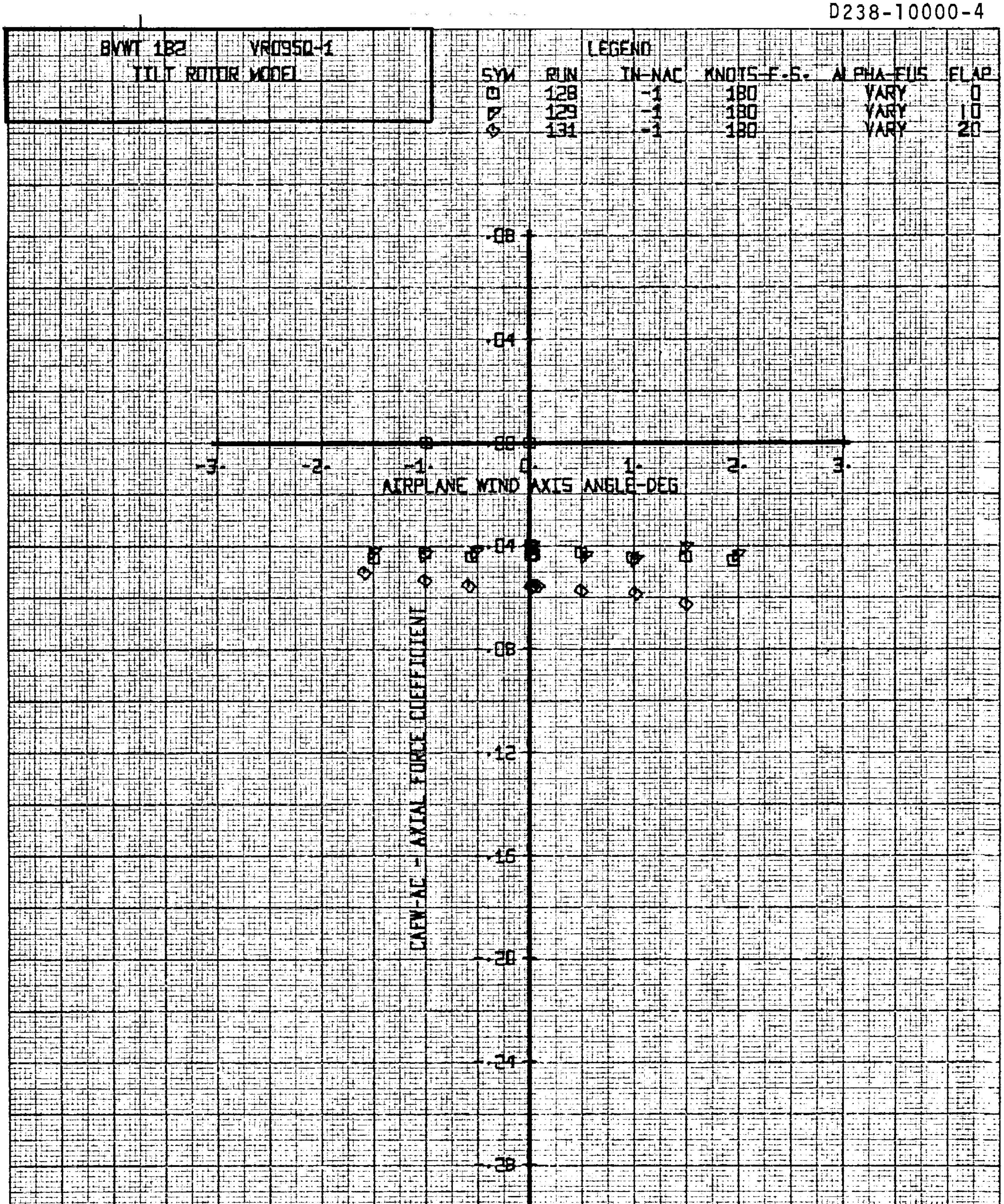


Figure 14-015. Aircraft Axial Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. $\delta_F = 0, 10°, 20°$

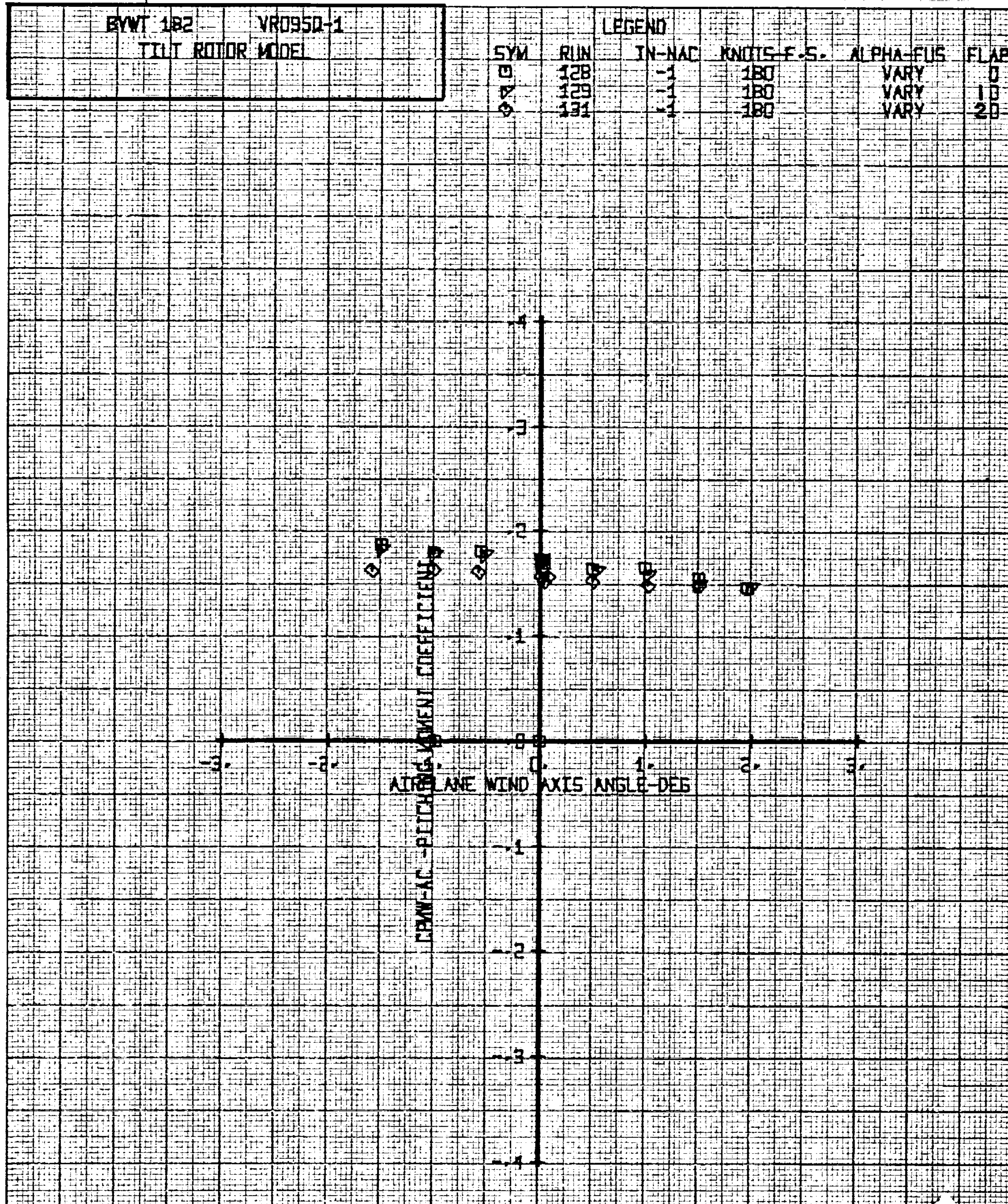


Figure 14-016. Aircraft Pitching Moment Versus Angle of Attack.
$I_N = -1°$ Full Scale Airspeed 180 Knots.
$\delta_F = 0, 10°, 20°$

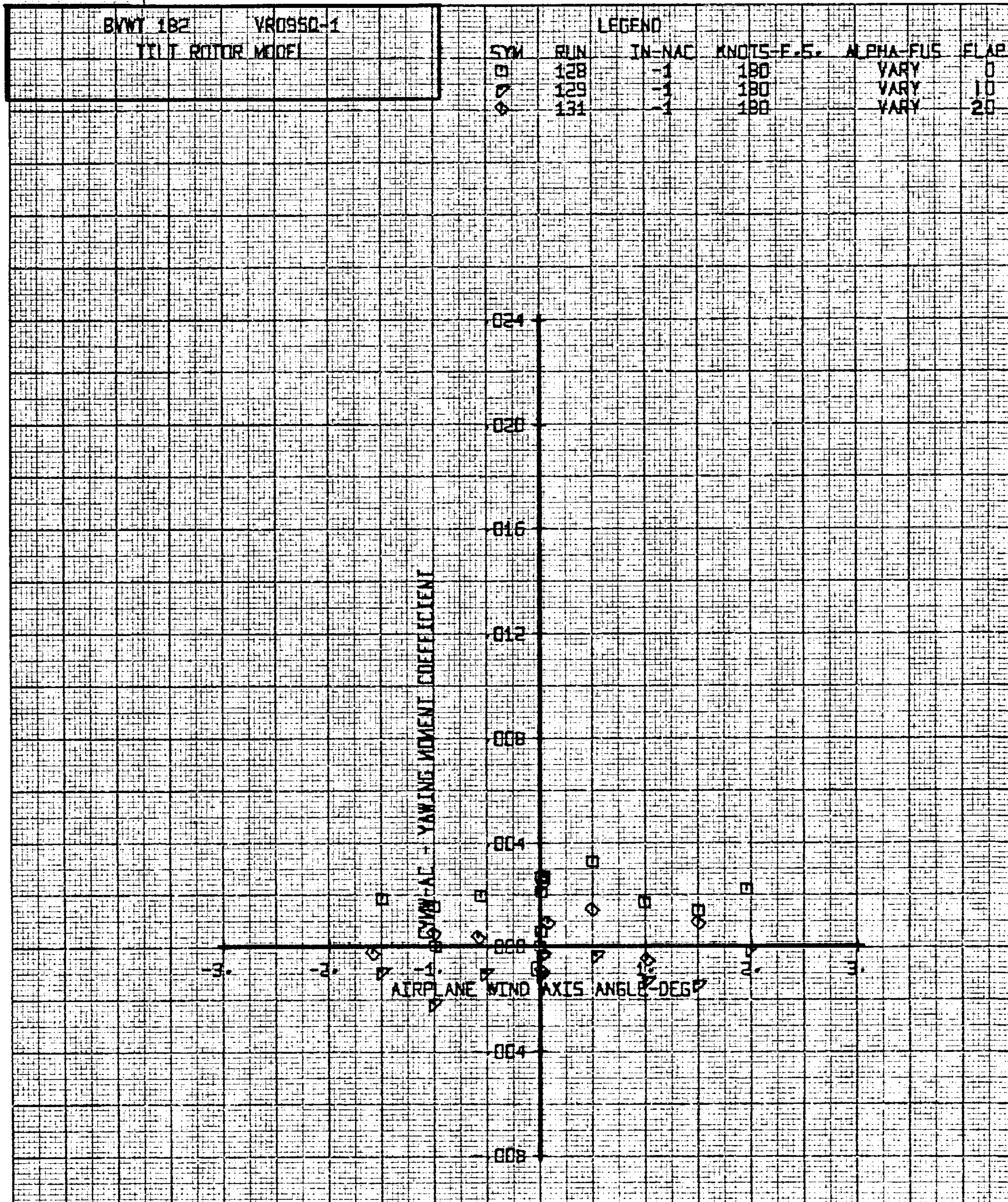


Figure 14-017. Aircraft Yawing Moment Versus Angle of Attack.
I_N = -1° Full Scale Airspeed 180 Knots.
δ_F = 0, 10°, 20°

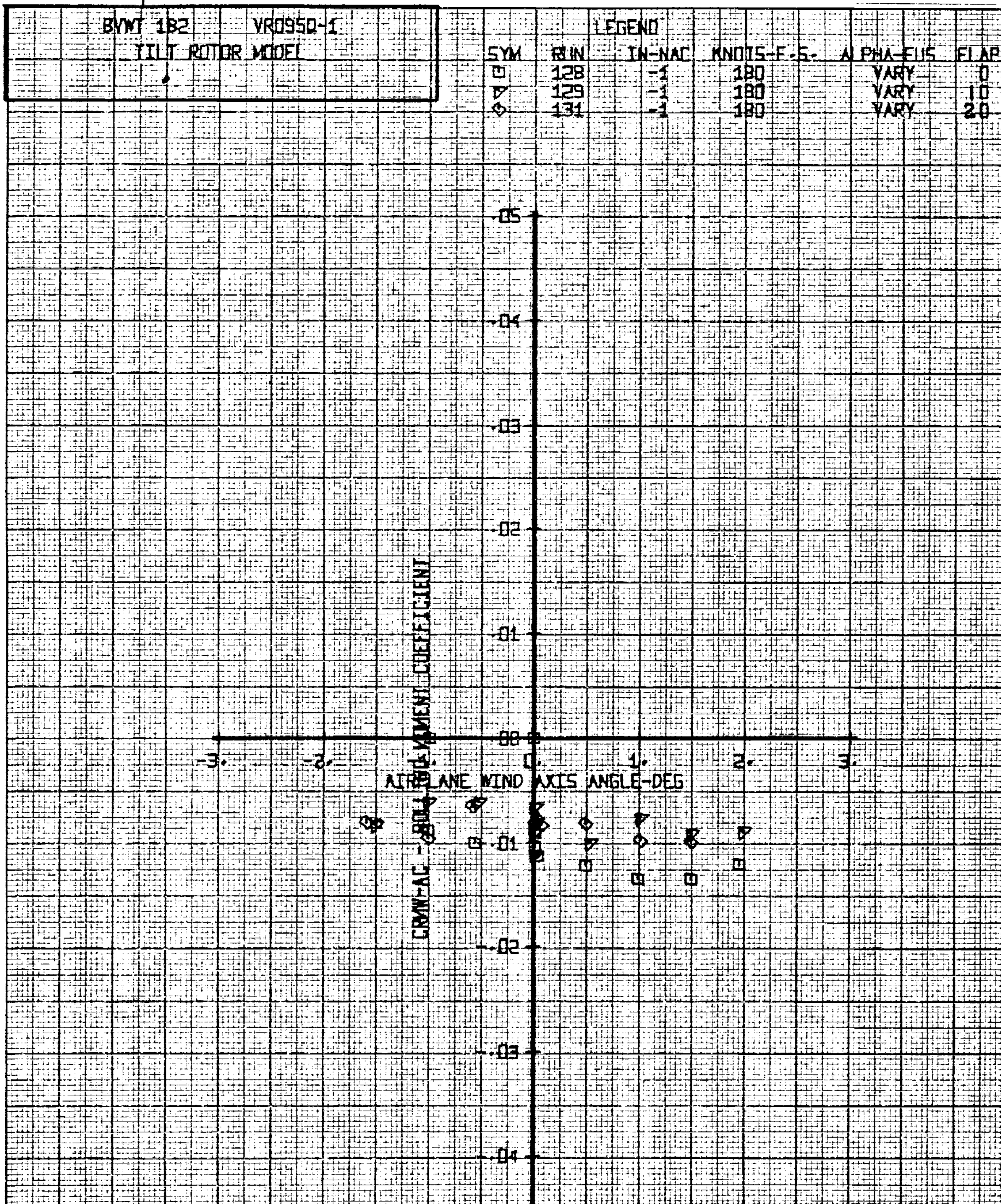


Figure 14-018. Aircraft Rolling Moment Versus Angle of Attack.
$I_N = -1°$ Full Scale Airspeed 180 Knots.
$\delta_F = 0, 10°, 20°$

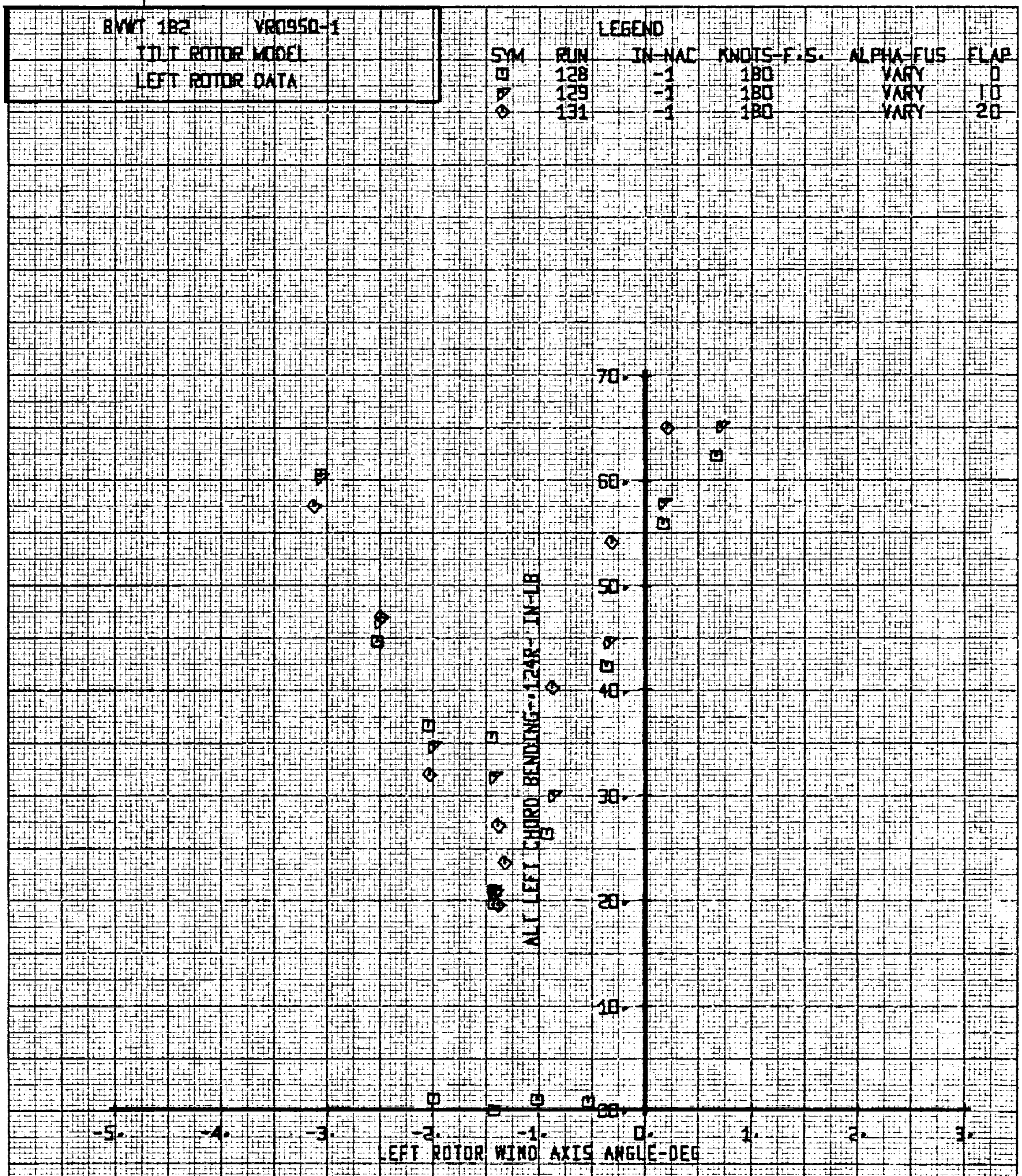


Figure 14-019. Alt. Left Chord Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. $\delta_F = 0, 10°, 20°$

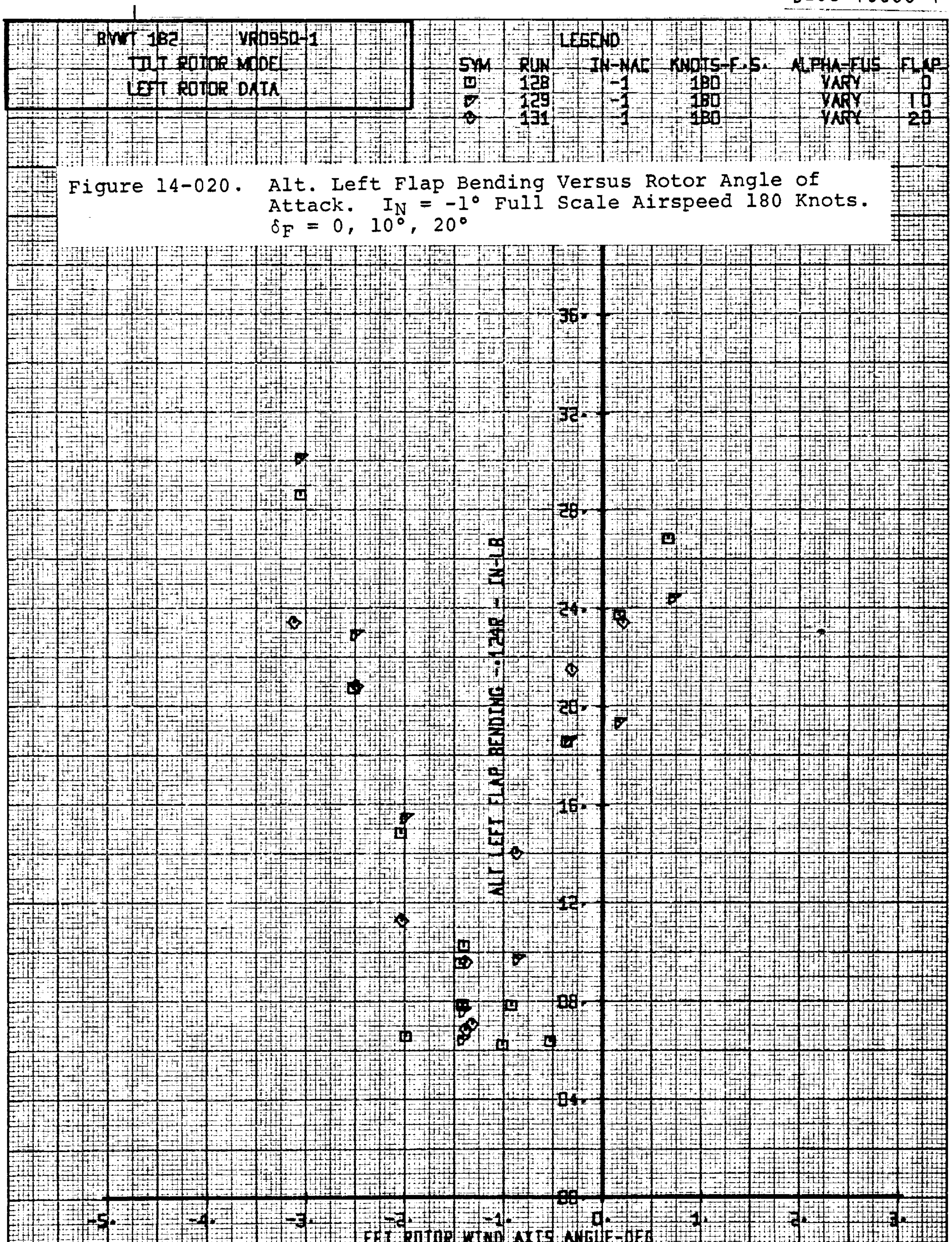


Figure 14-020. Alt. Left Flap Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. $\delta_F = 0, 10°, 20°$

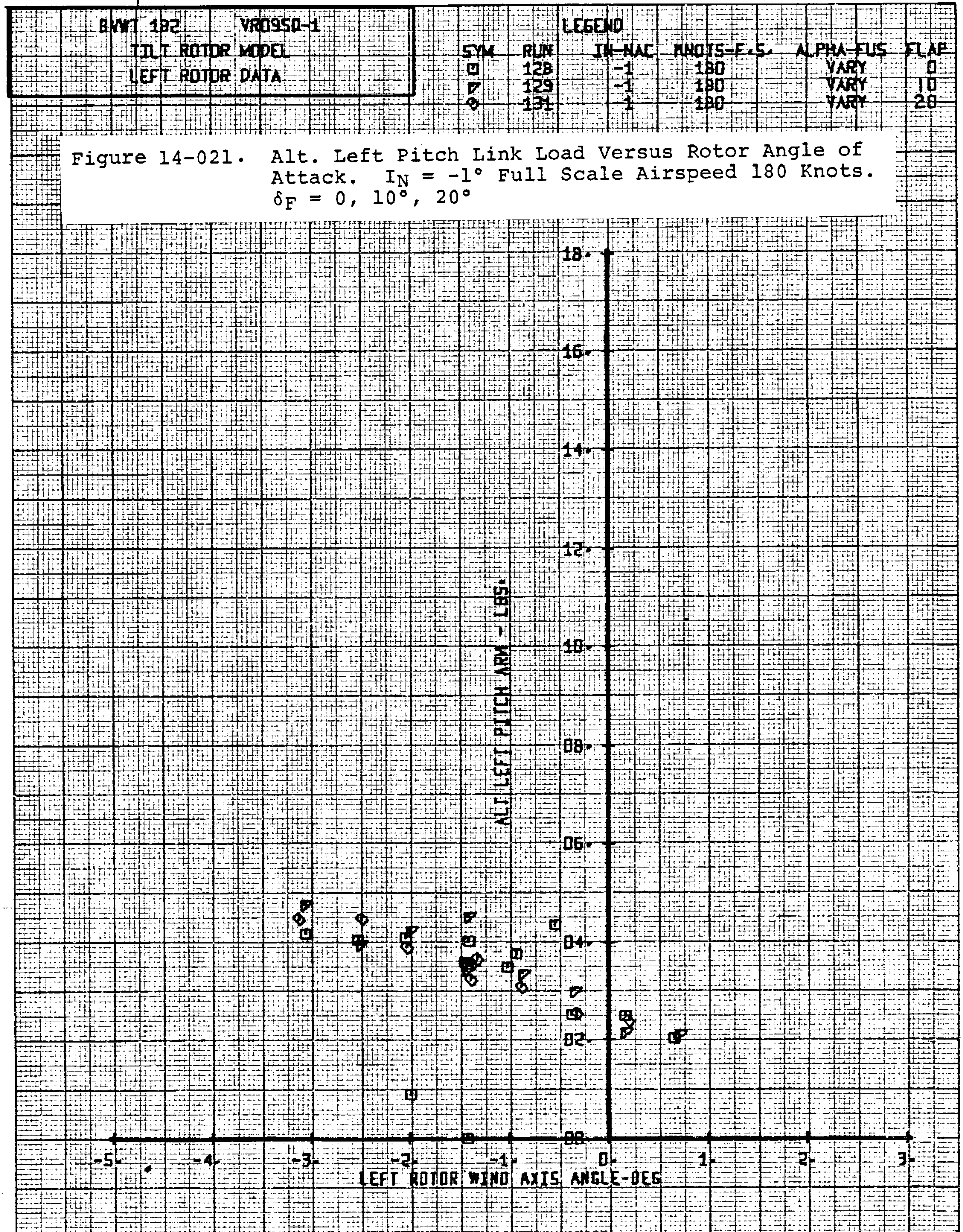


Figure 14-021. Alt. Left Pitch Link Load Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. $\delta_F = 0, 10°, 20°$

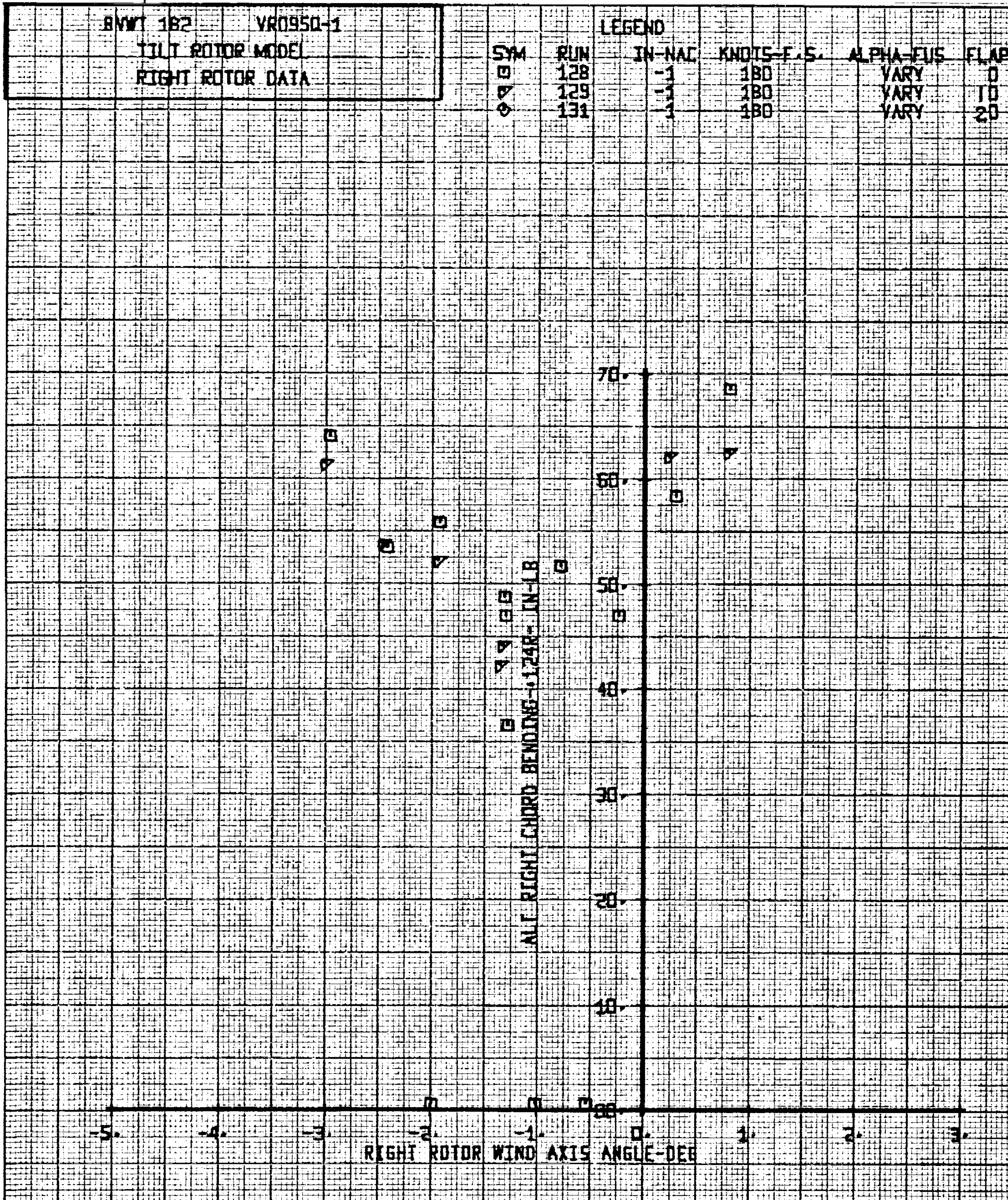
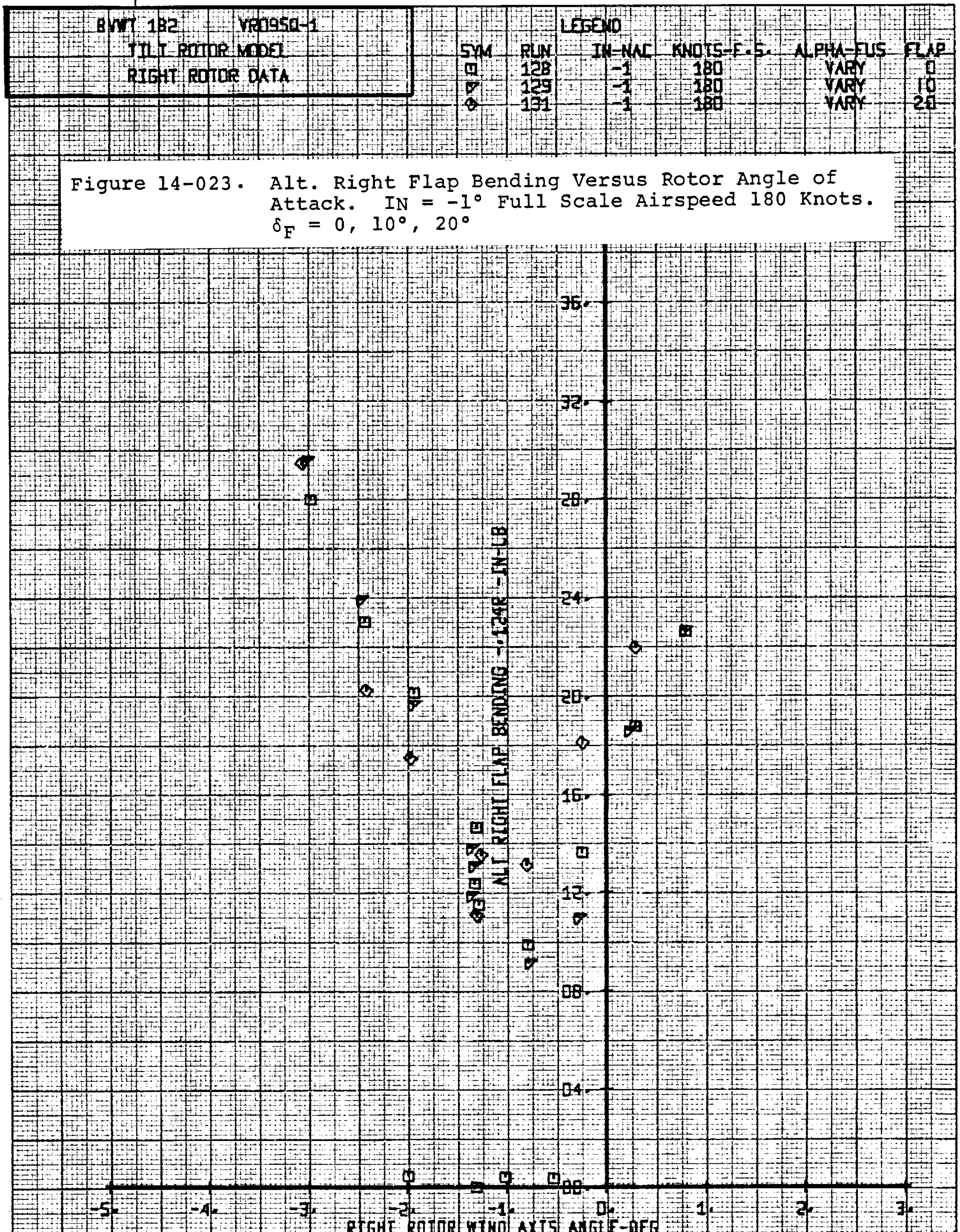


Figure 14-022. Alt. Right Chord Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. $\delta_F = 0, 10°, 20°$

Figure 14-023. Alt. Right Flap Bending Versus Rotor Angle of Attack. IN = -1° Full Scale Airspeed 180 Knots. δ_F = 0, 10°, 20°



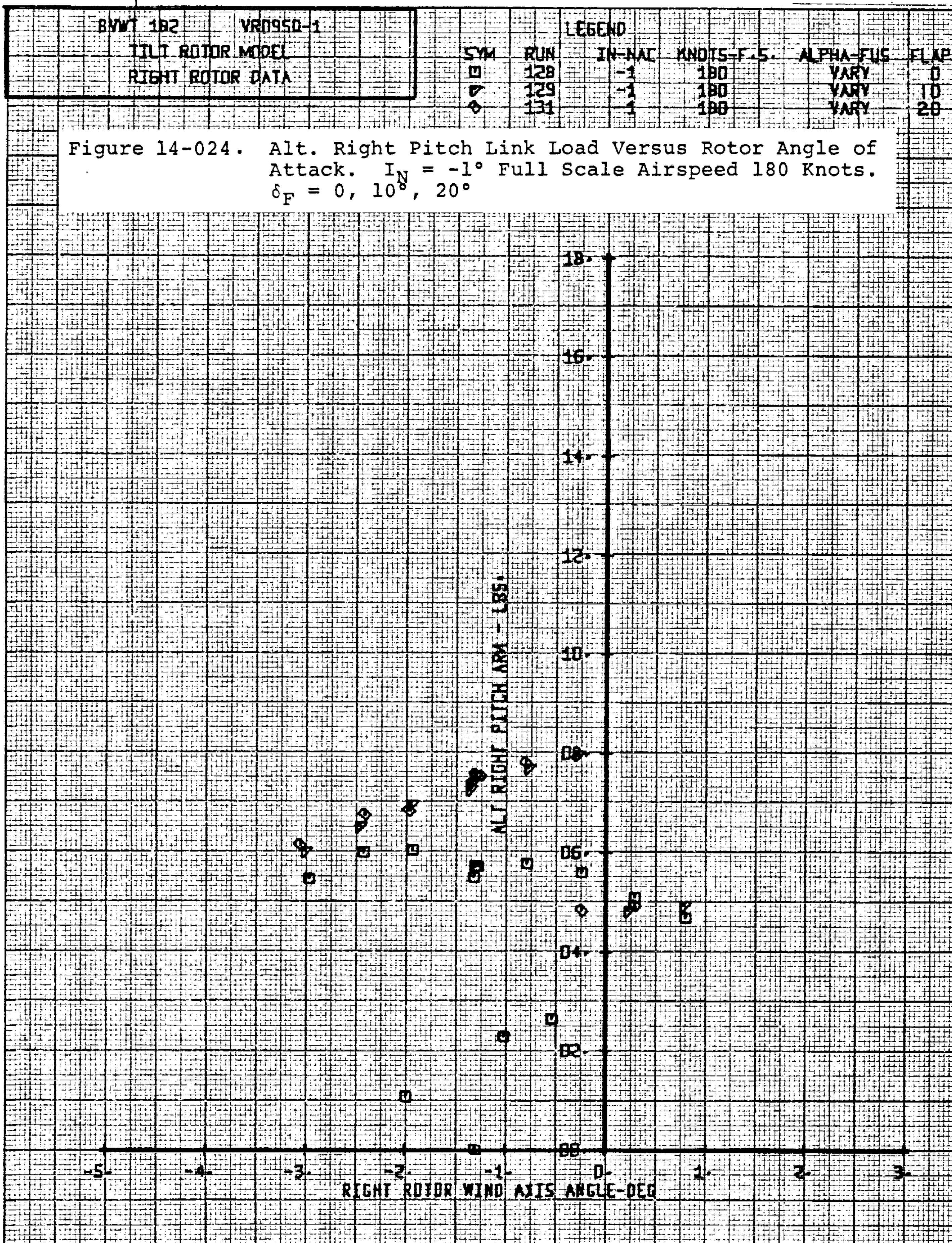
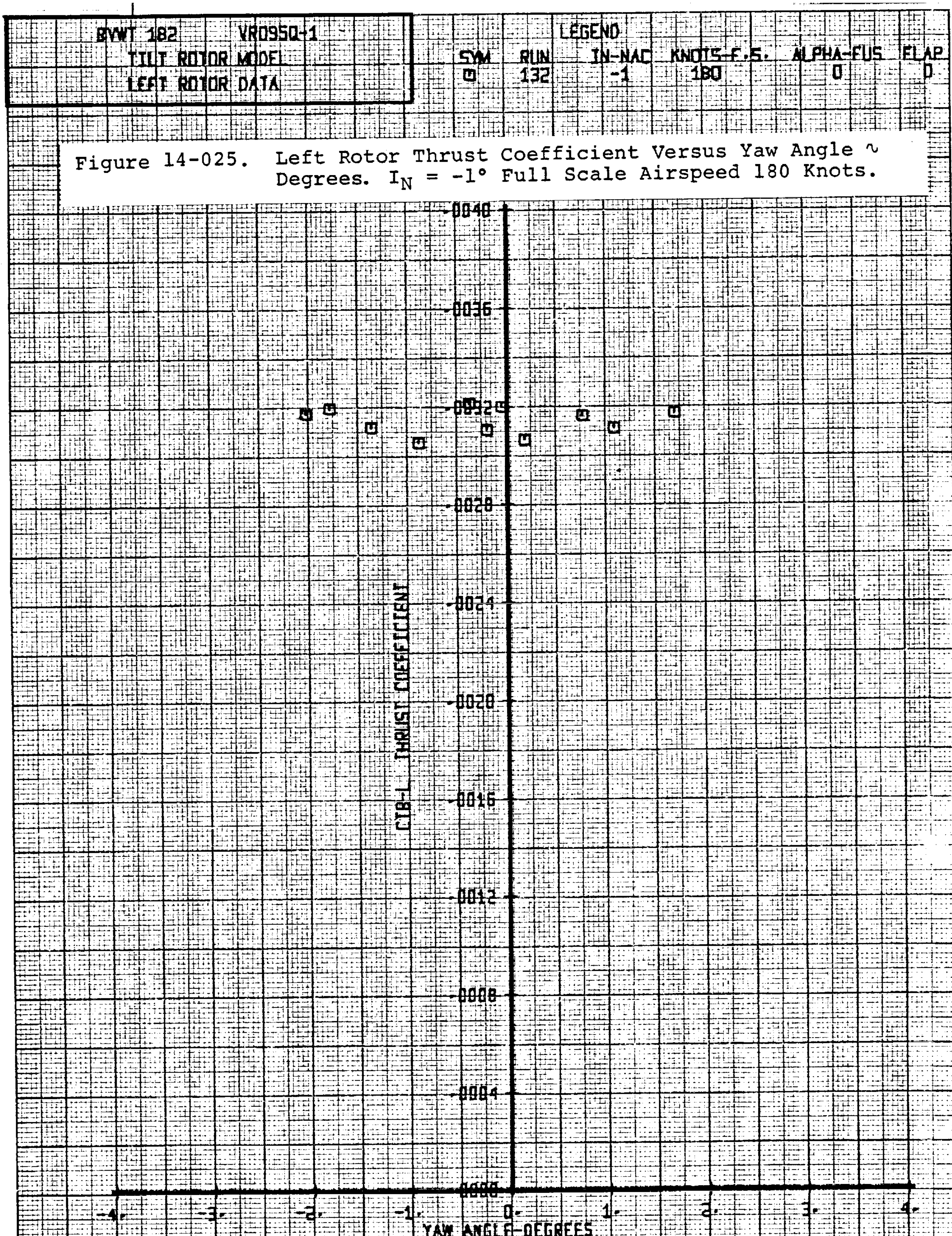


Figure 14-024. Alt. Right Pitch Link Load Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 180 Knots. $\delta_F = 0, 10°, 20°$

85 182 SET 85 BVWT 182

Figure 14-025. Left Rotor Thrust Coefficient Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.



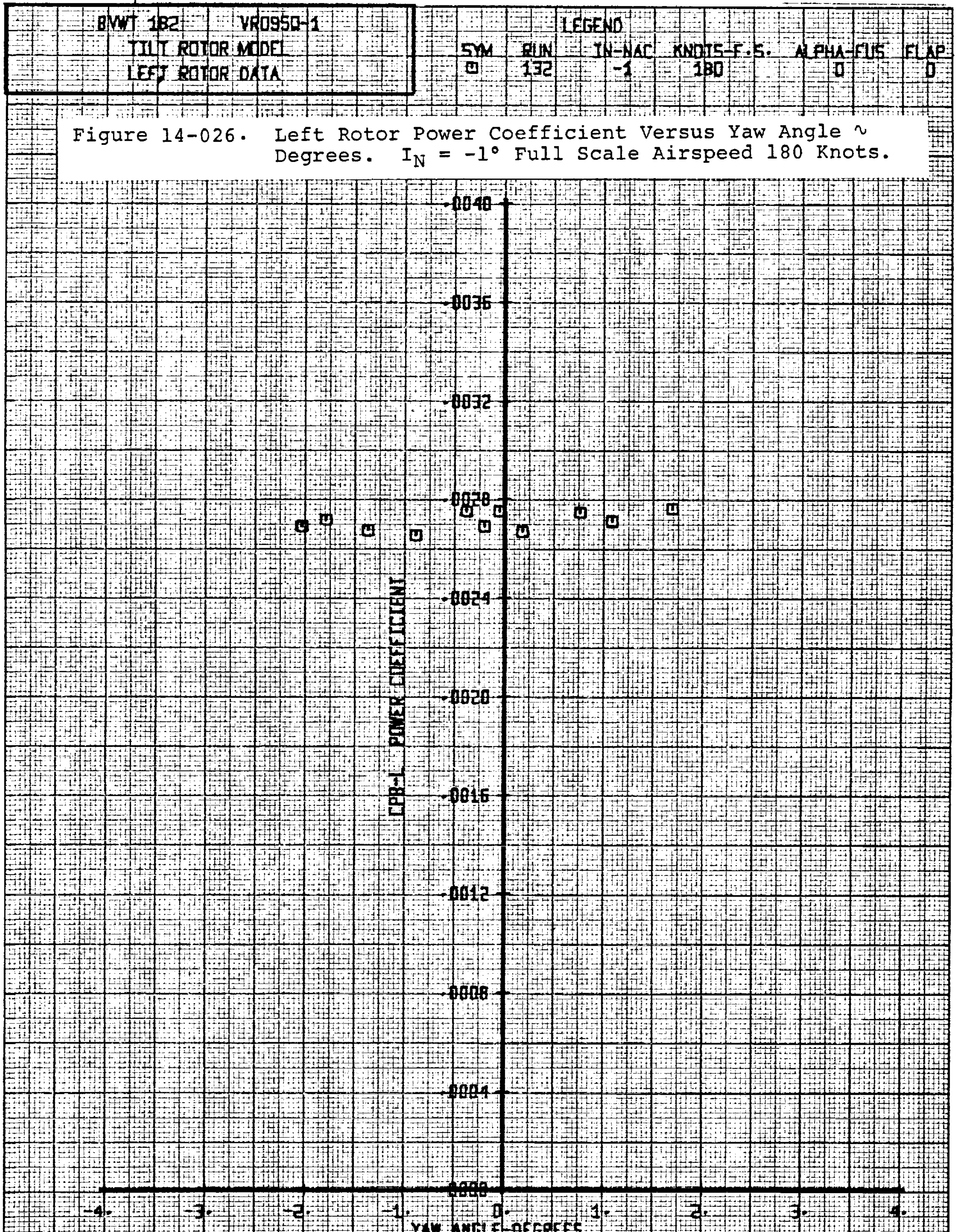


Figure 14-026. Left Rotor Power Coefficient Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

86
182

SET 86
BVWT 182

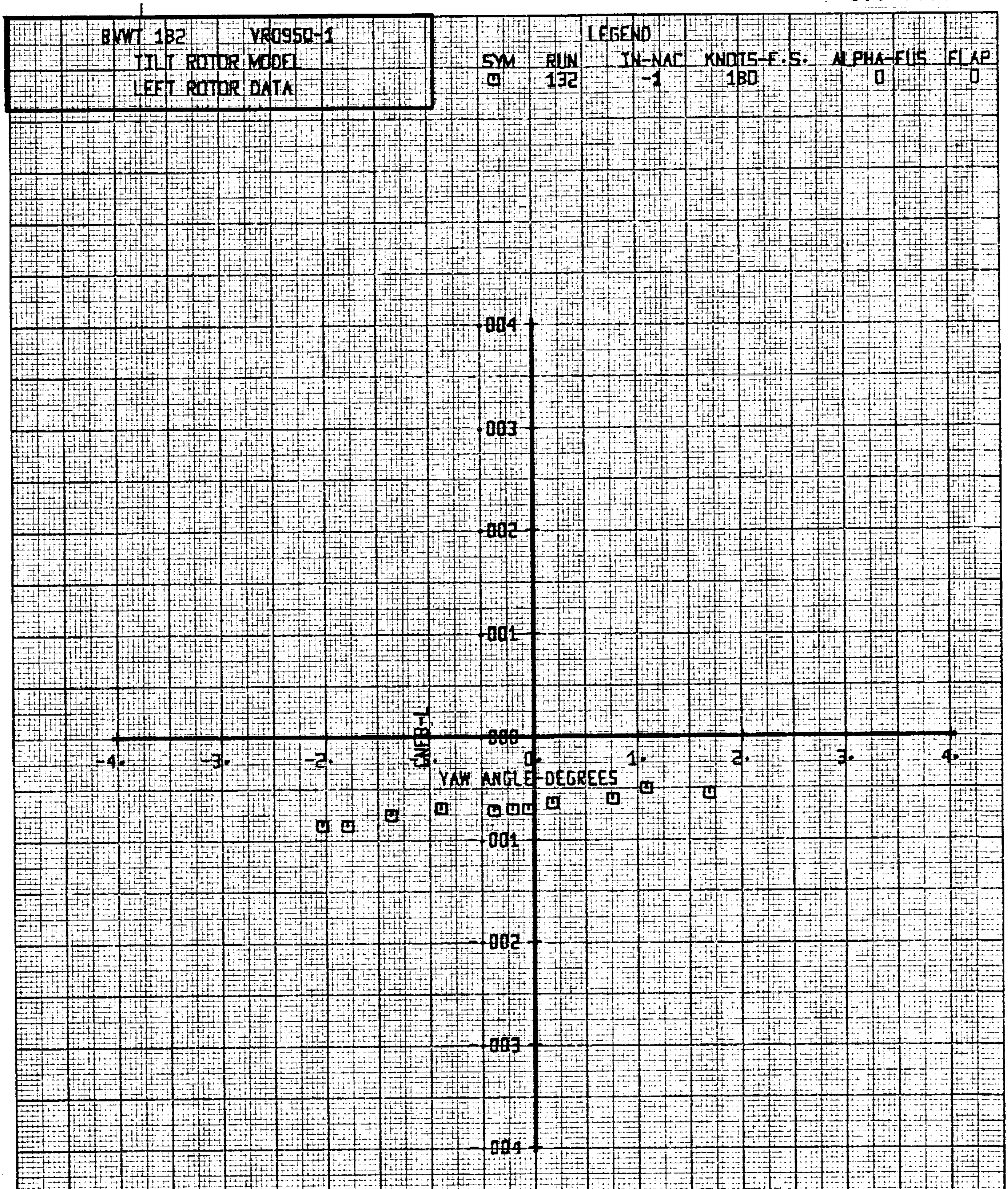


Figure 14-027. Left Rotor Normal Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

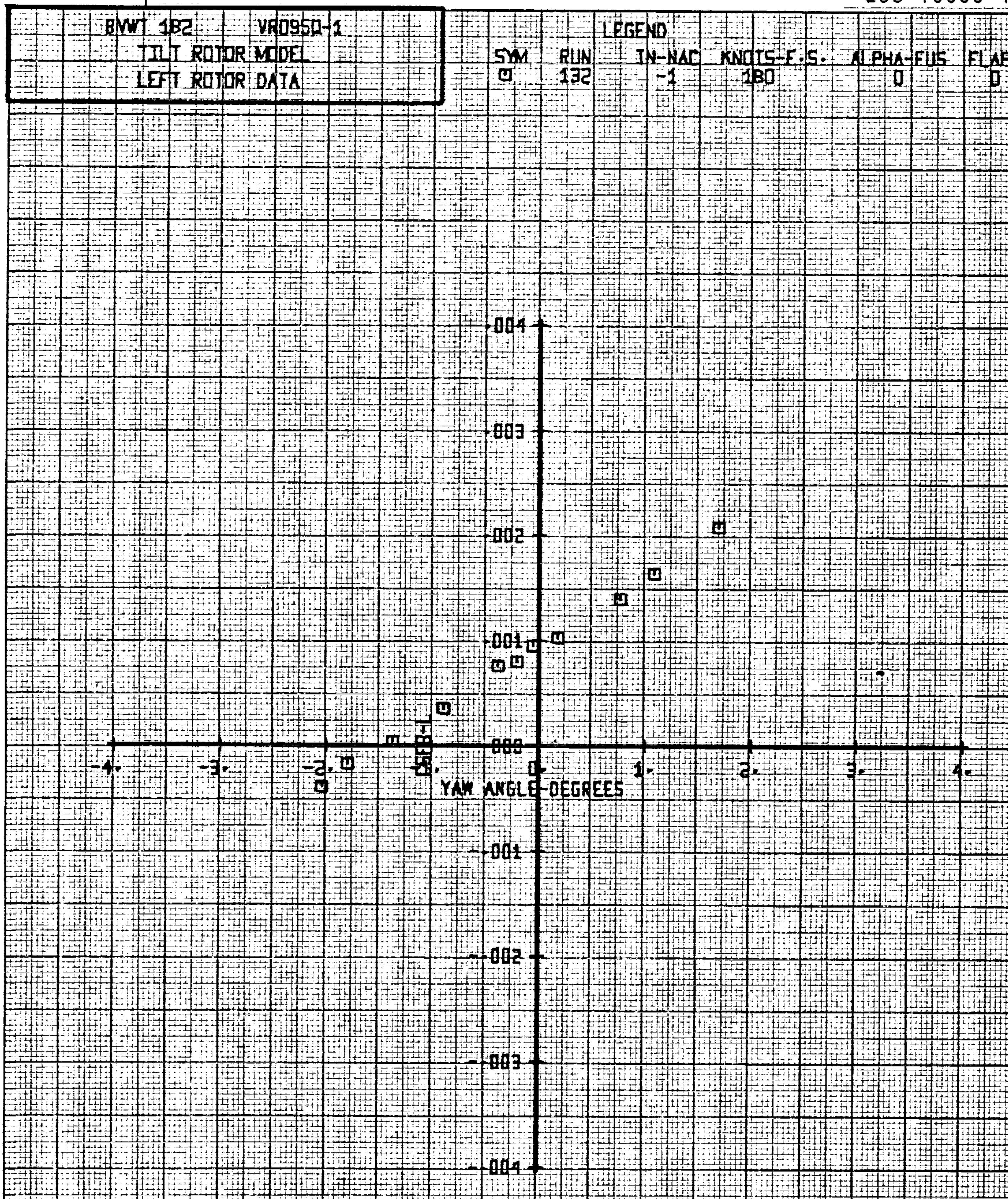


Figure 14-028. Left Rotor Side Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

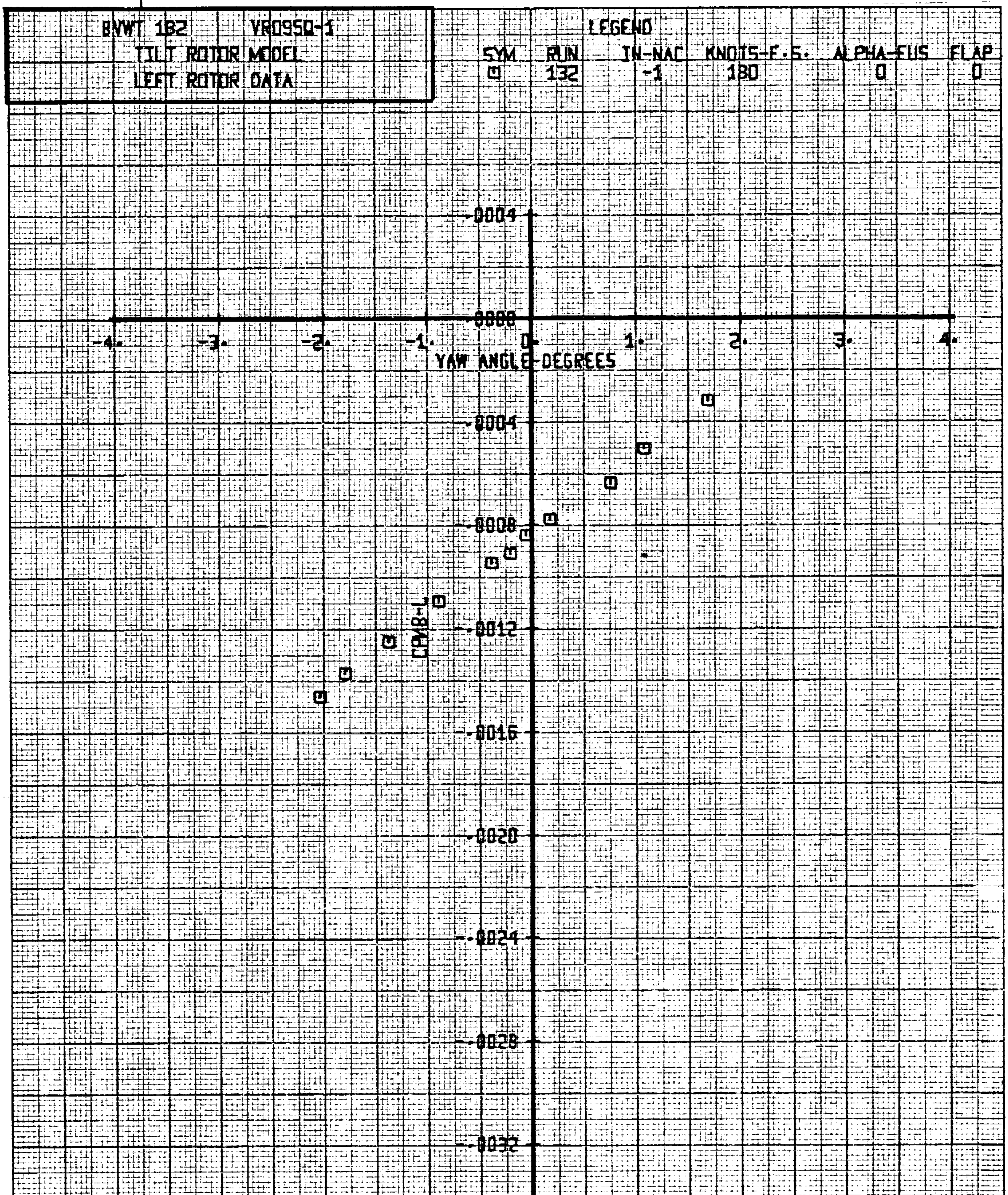


Figure 14-029. Left Rotor Pitching Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

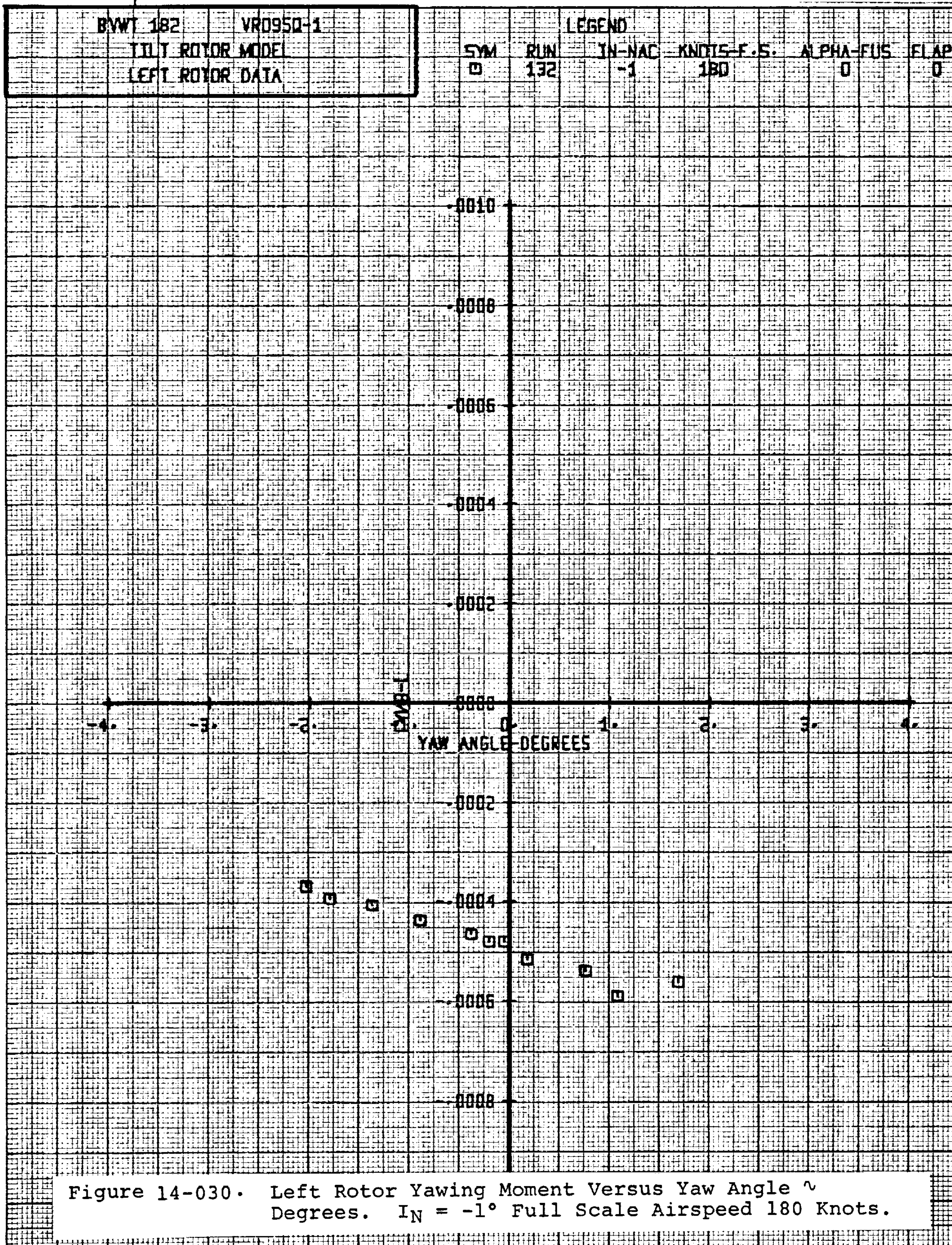


Figure 14-030. Left Rotor Yawing Moment Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.

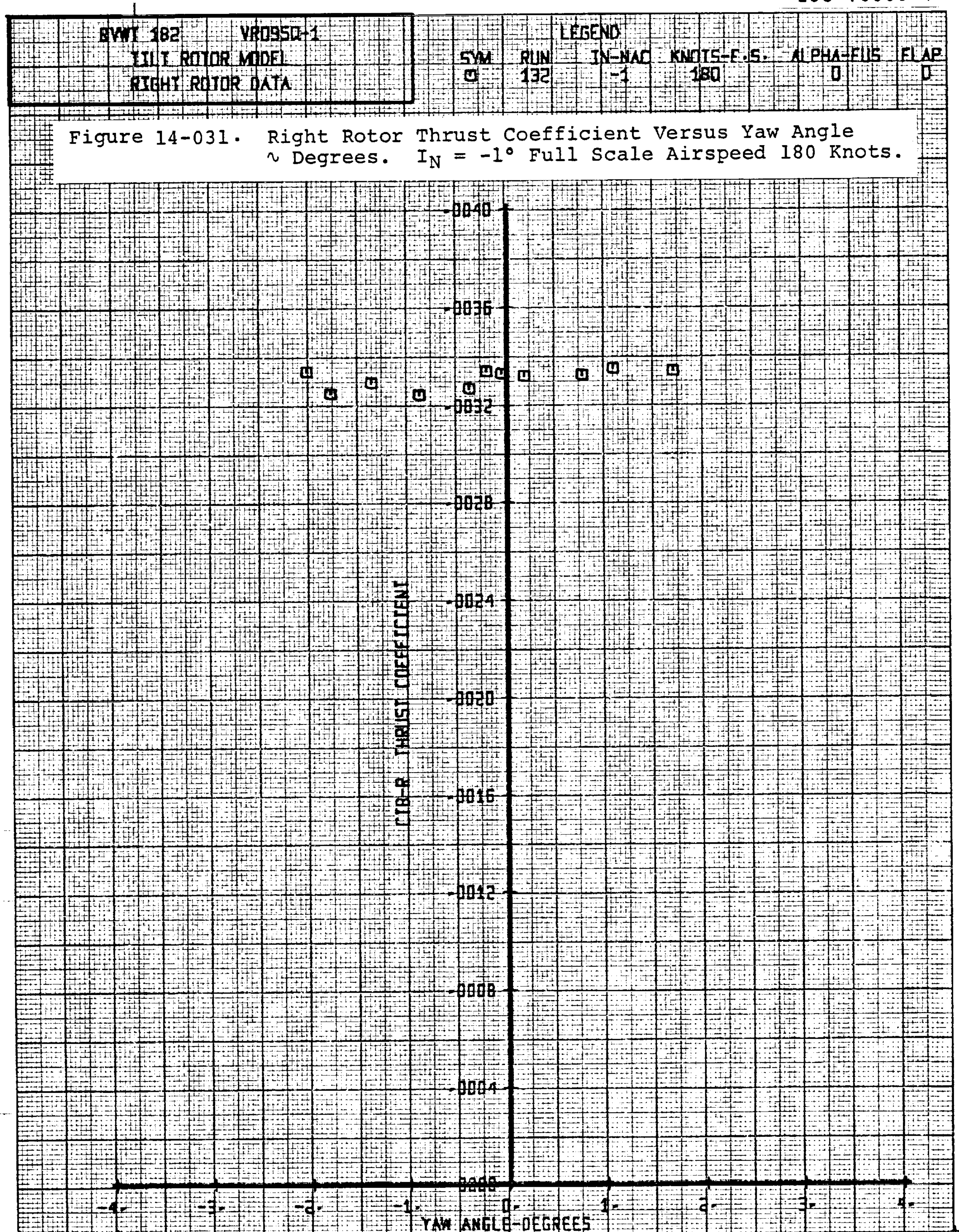


Figure 14-031. Right Rotor Thrust Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

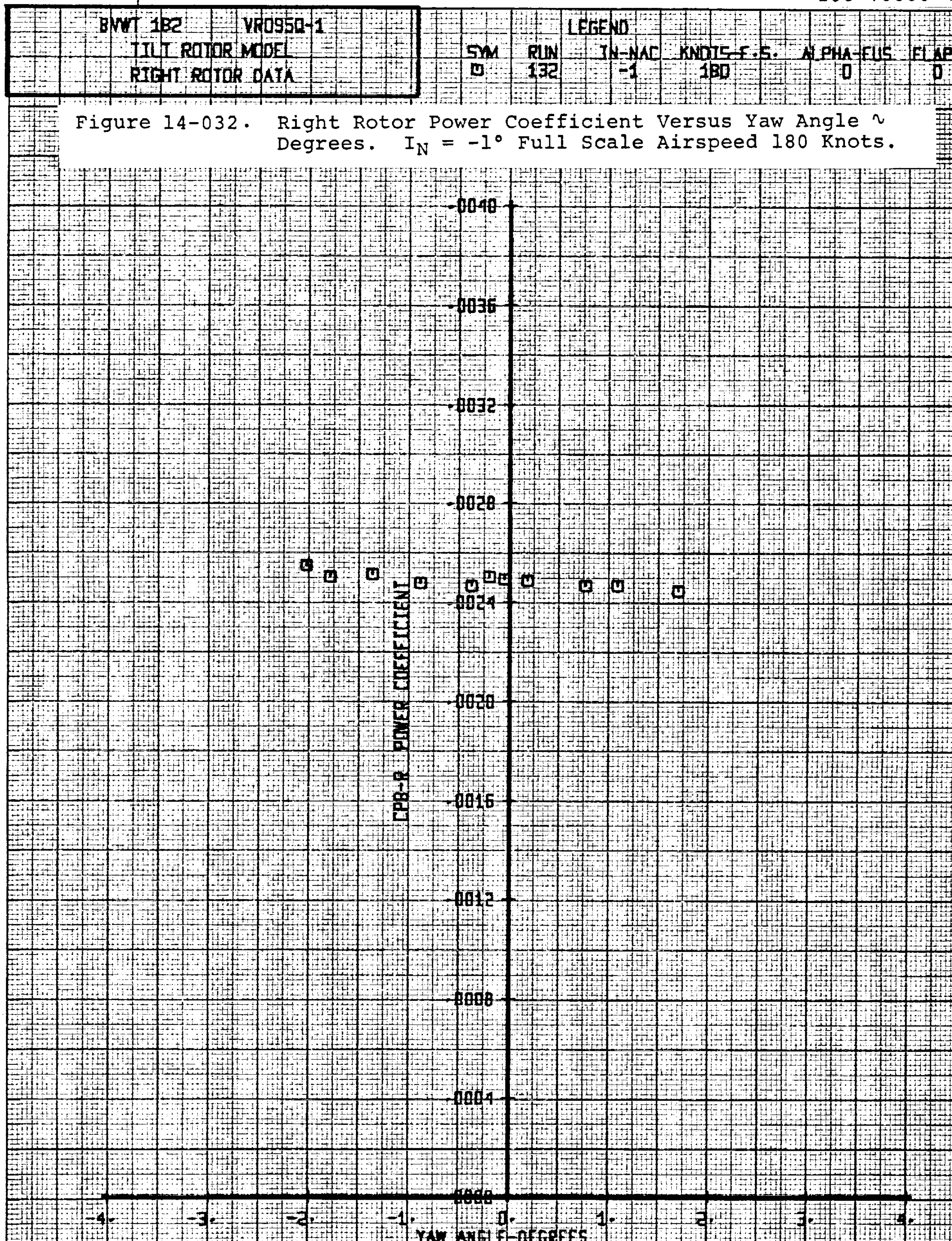


Figure 14-032. Right Rotor Power Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

86
182

SET 86
BVWT 182

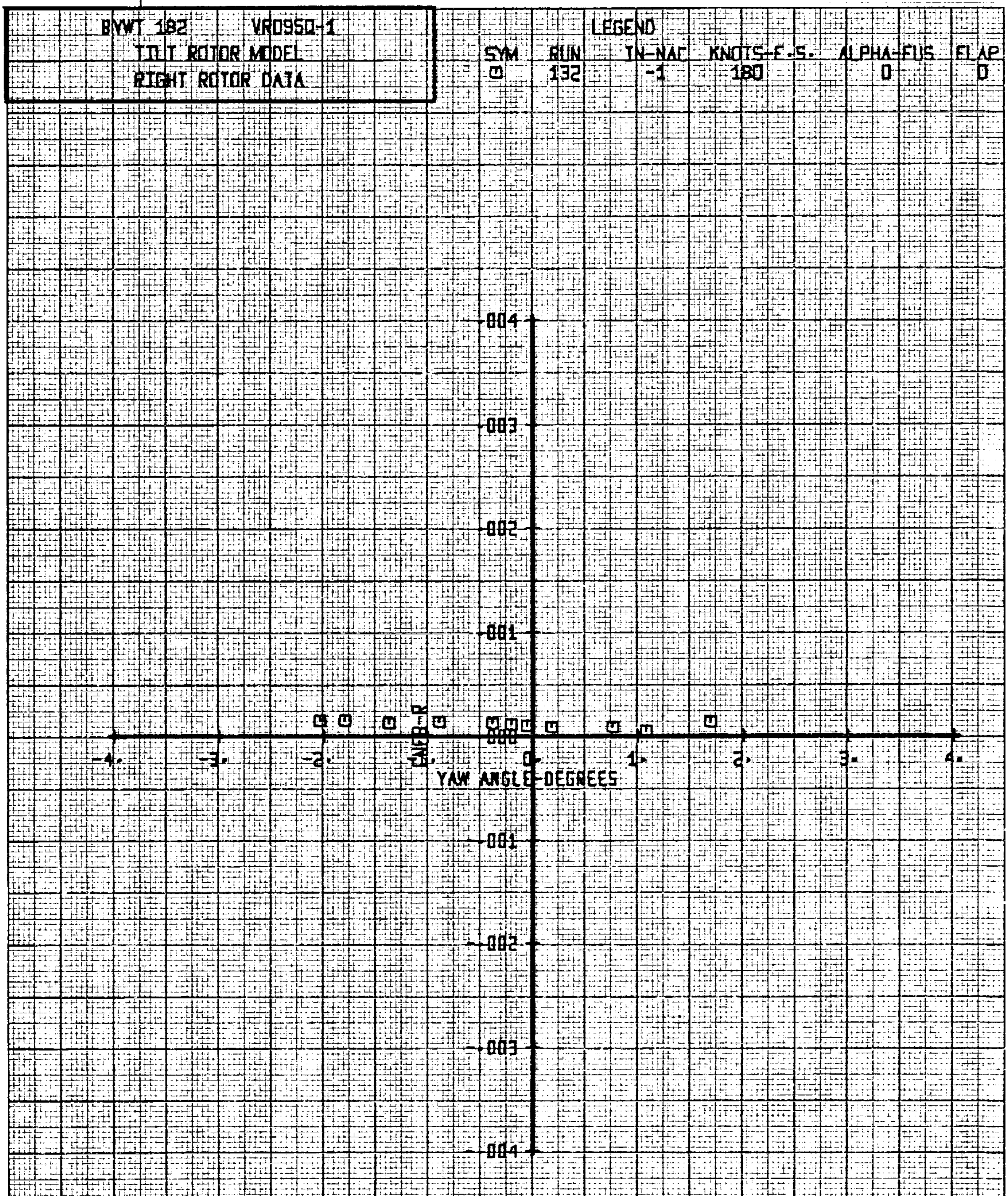


Figure 14-033. Right Rotor Normal Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.

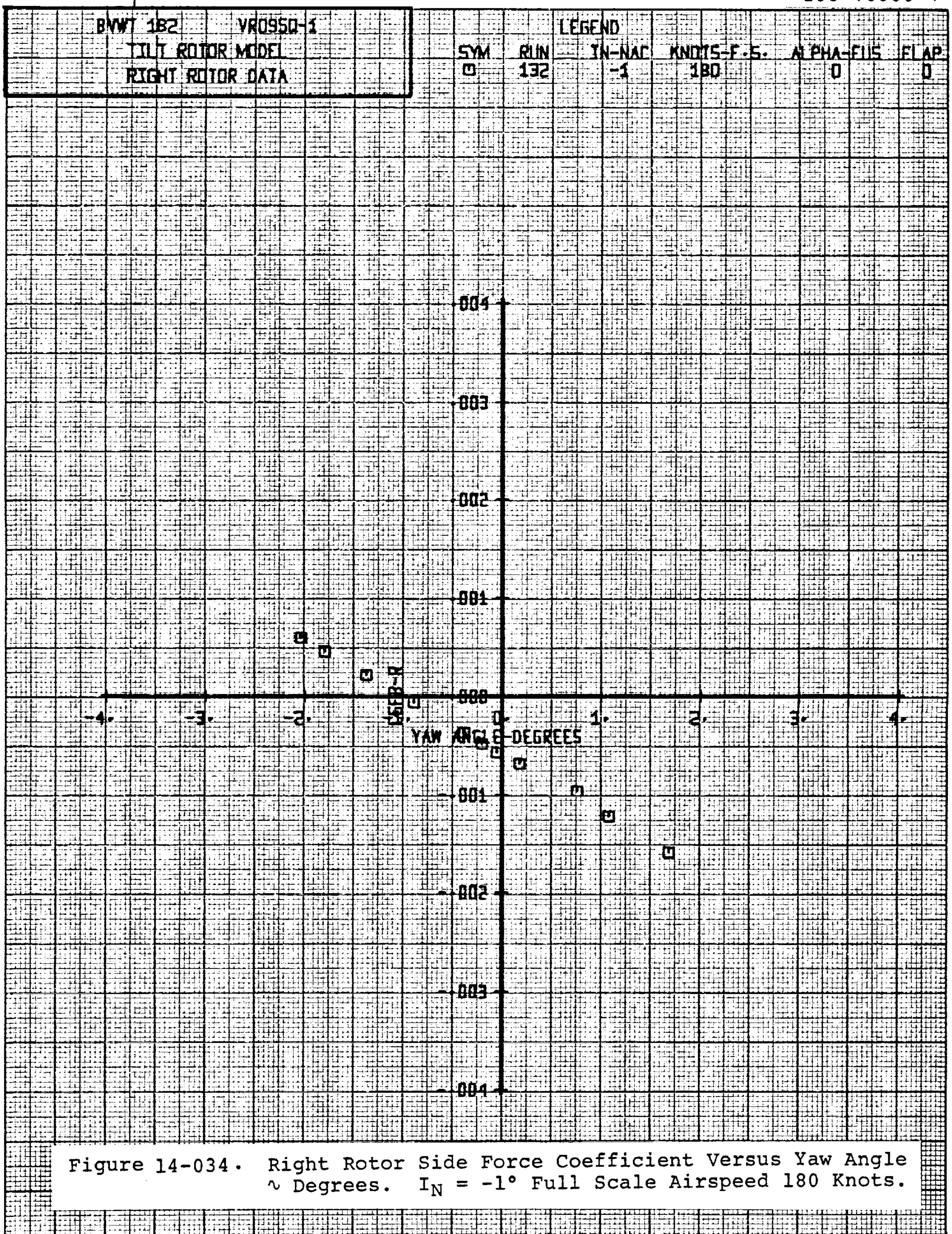


Figure 14-034. Right Rotor Side Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.

86
182

SET 86
BVWT 182

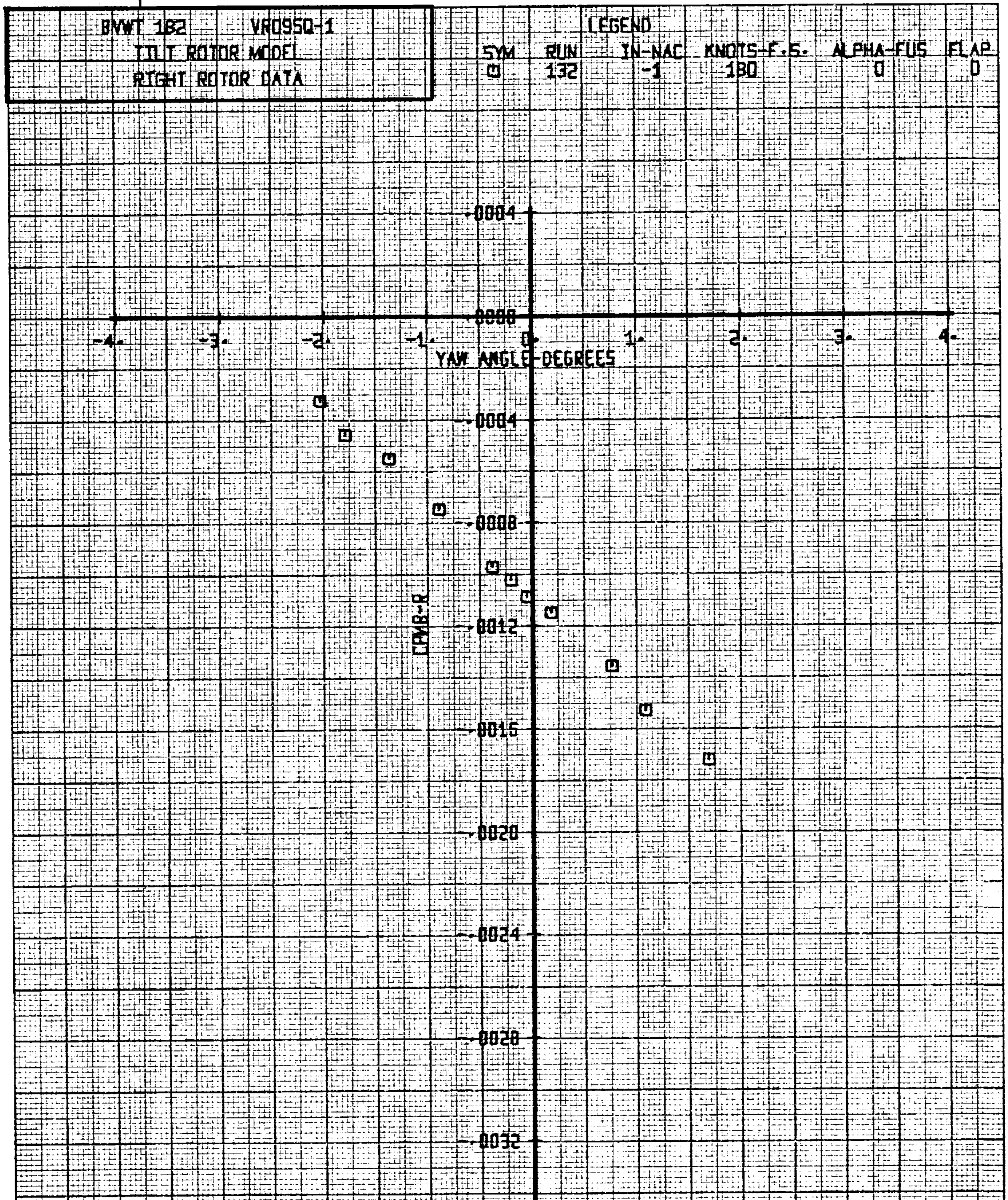


Figure 14-035. Right Rotor Pitching Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

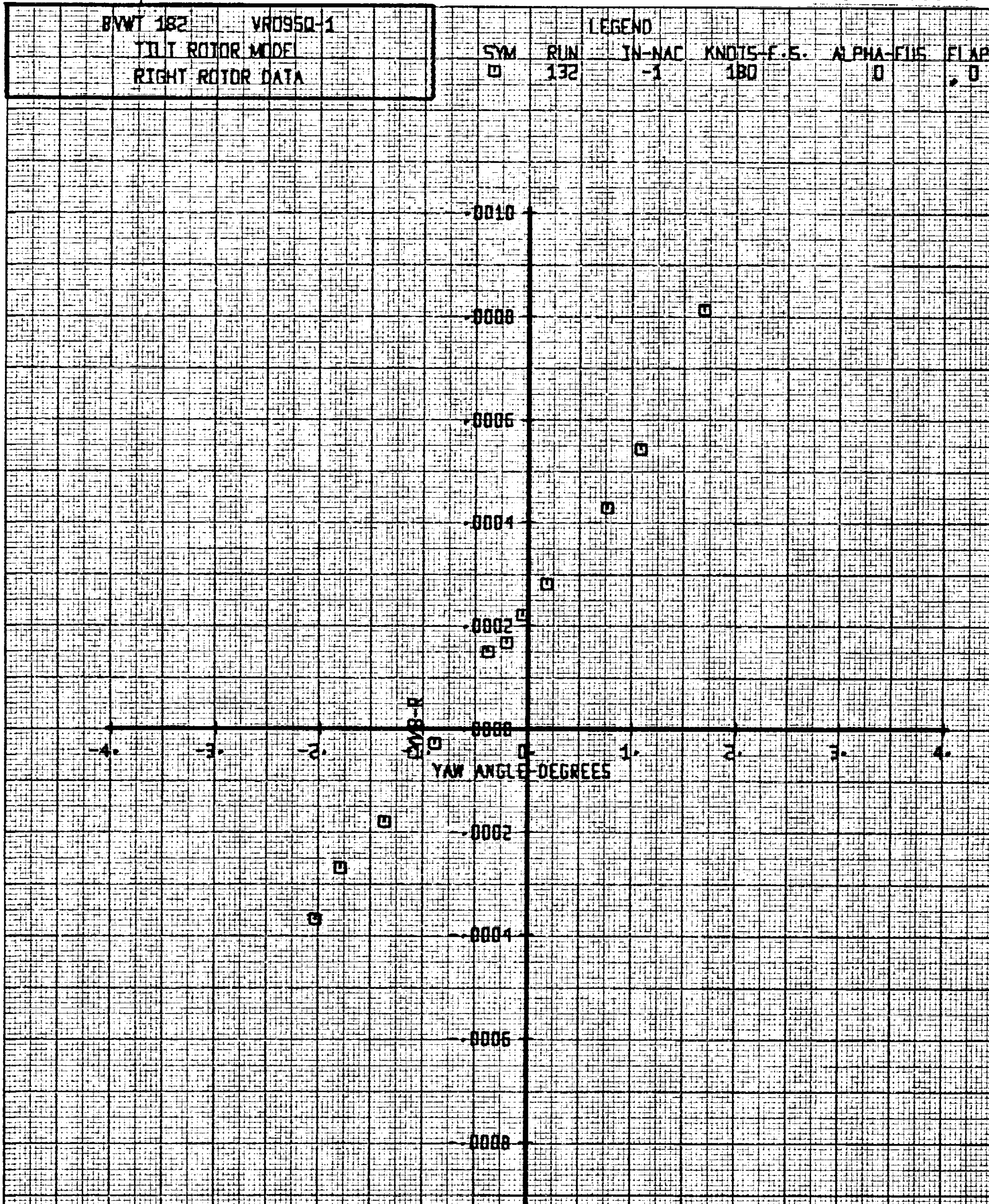


Figure 14-036. Right Rotor Yawing Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

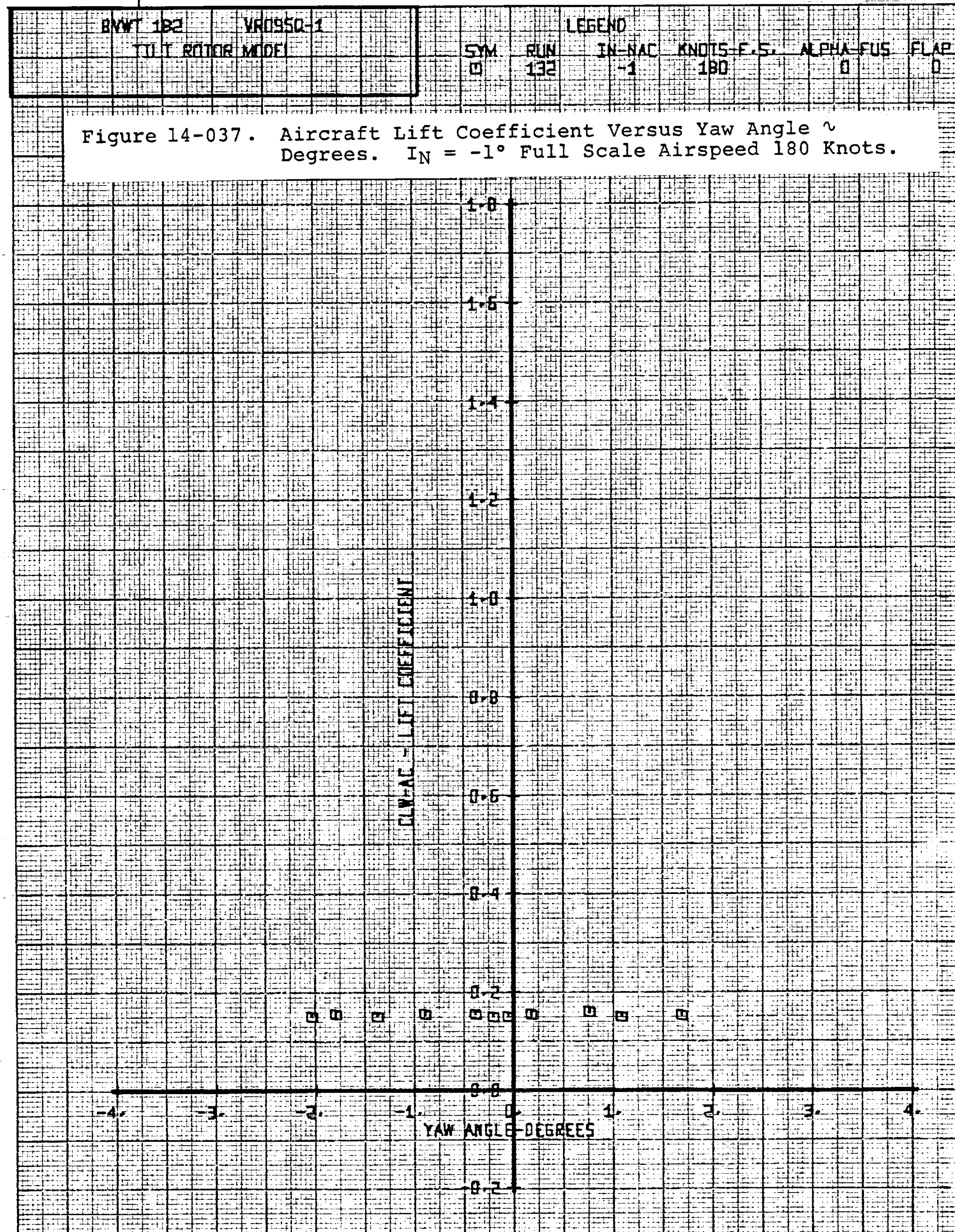


Figure 14-037. Aircraft Lift Coefficient Versus Yaw Angle ∿ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.

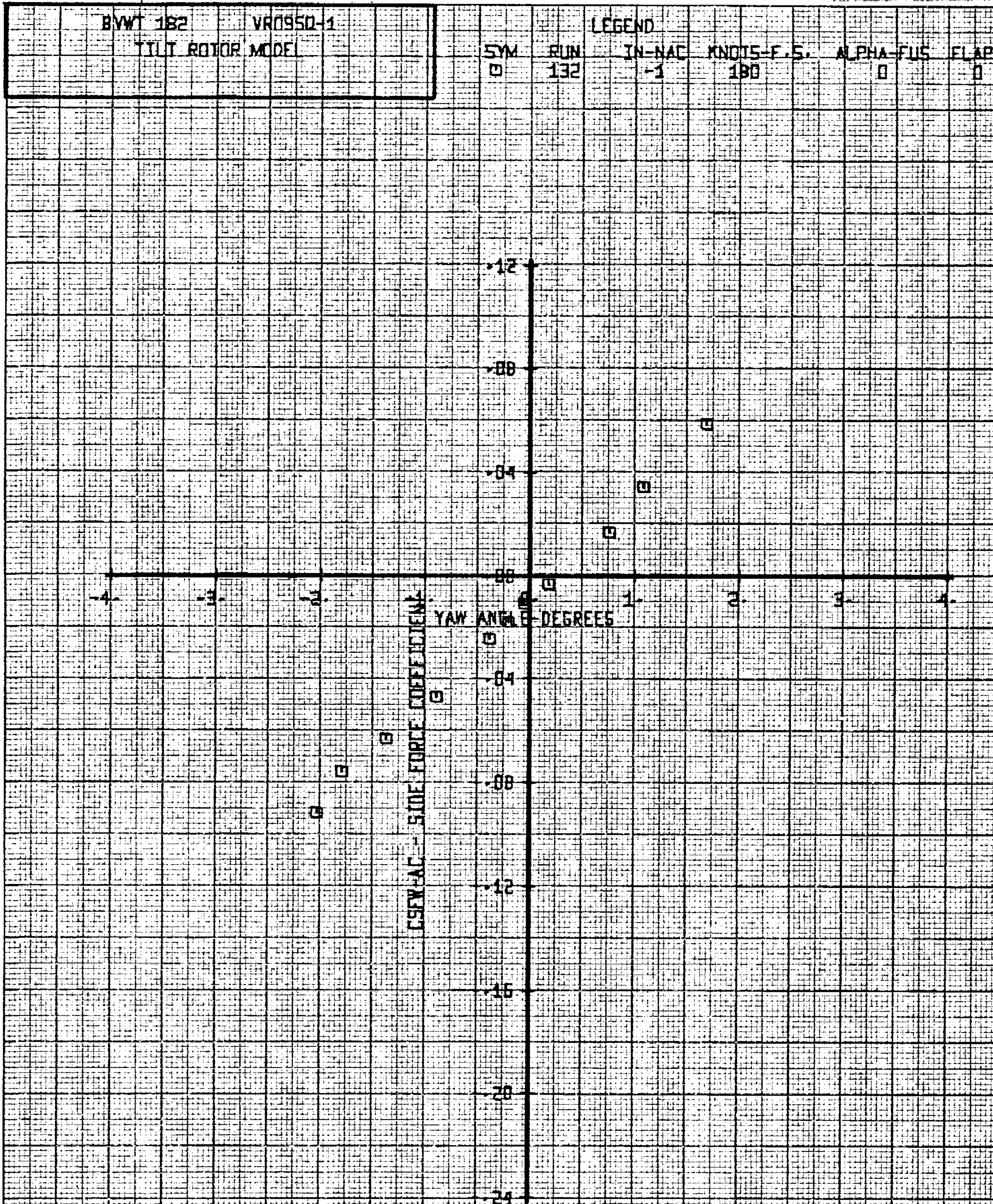


Figure 14-038. Aircraft Side Force Coefficient Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

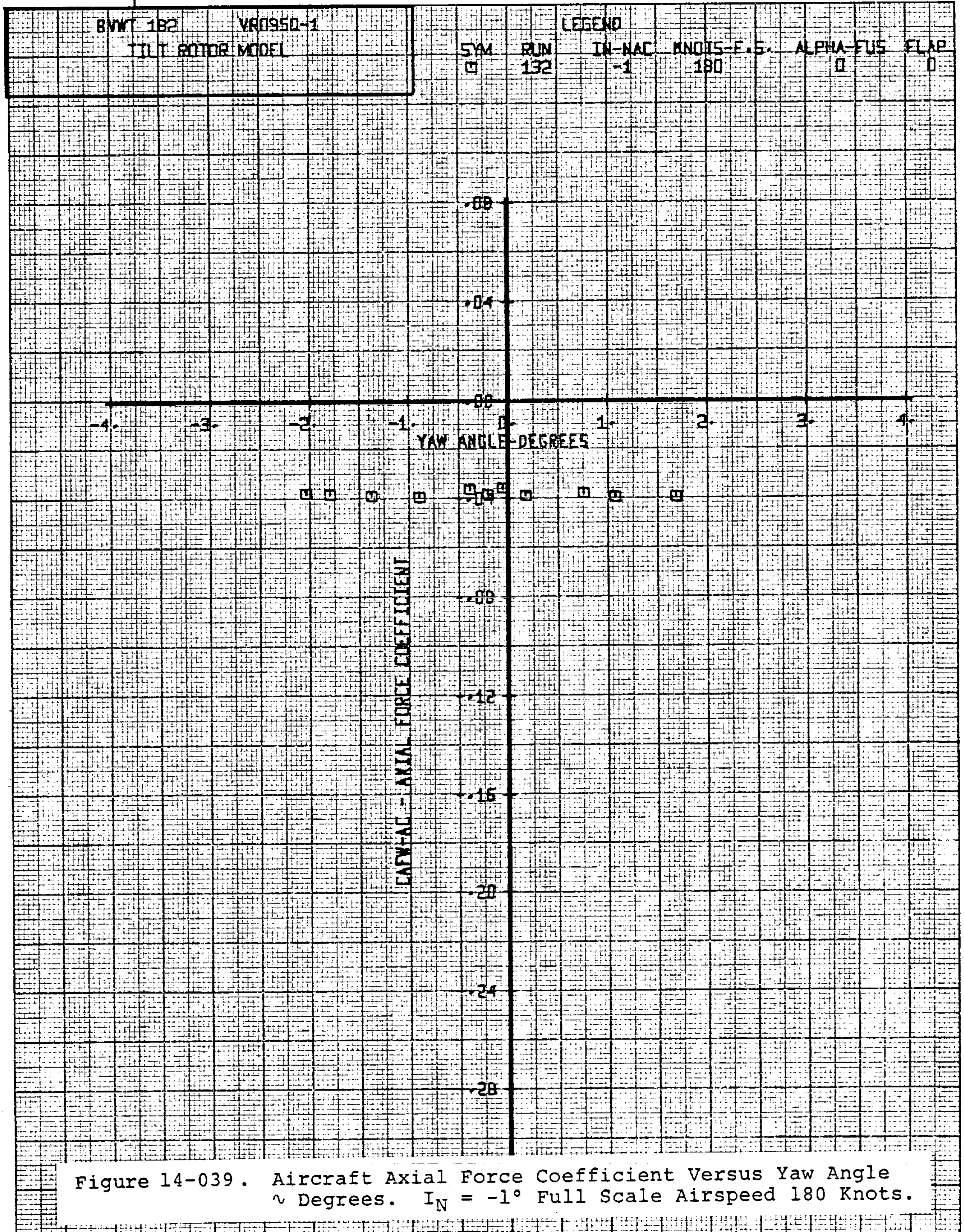


Figure 14-039. Aircraft Axial Force Coefficient Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

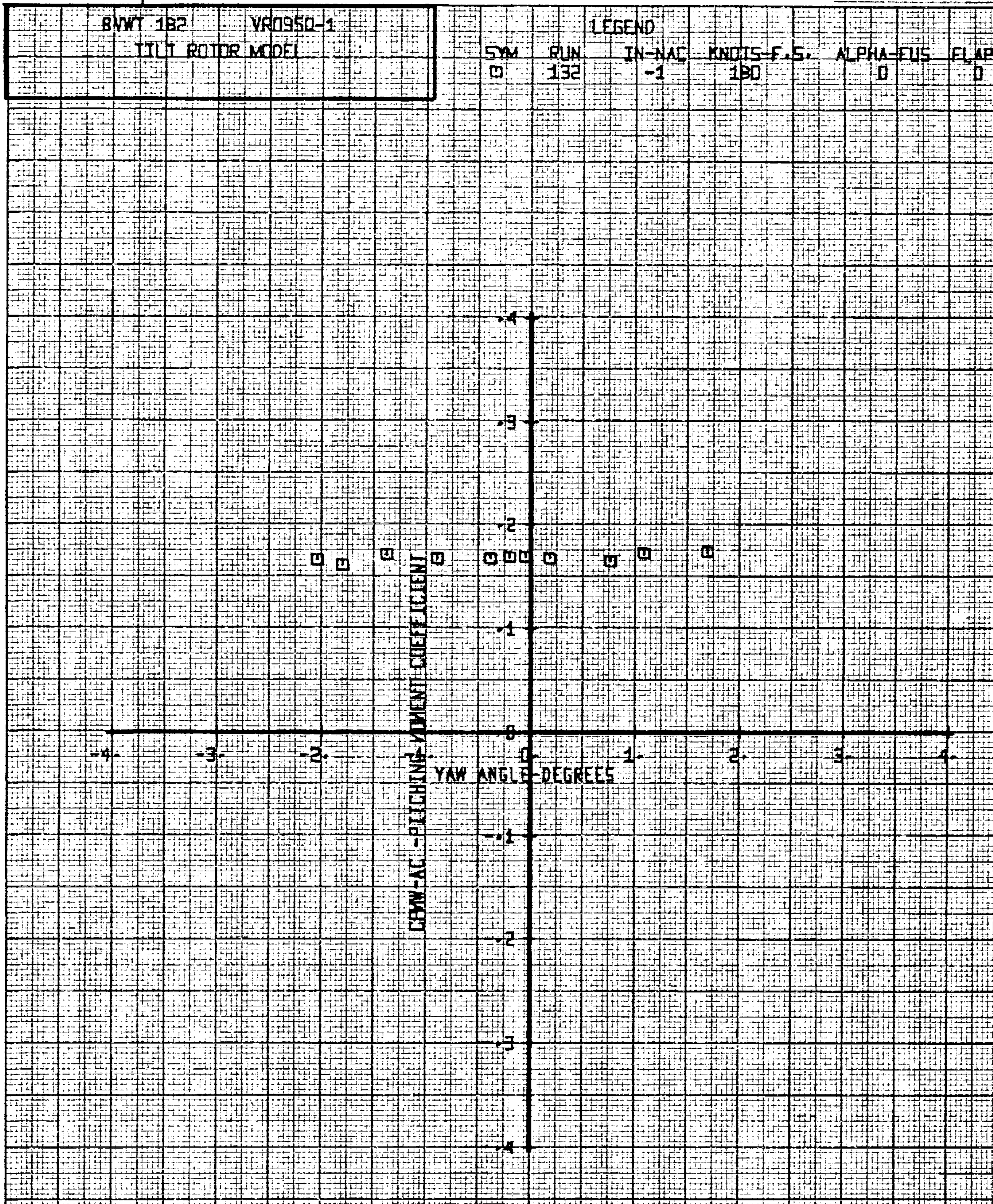


Figure 14-040. Aircraft Pitching Moment Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.

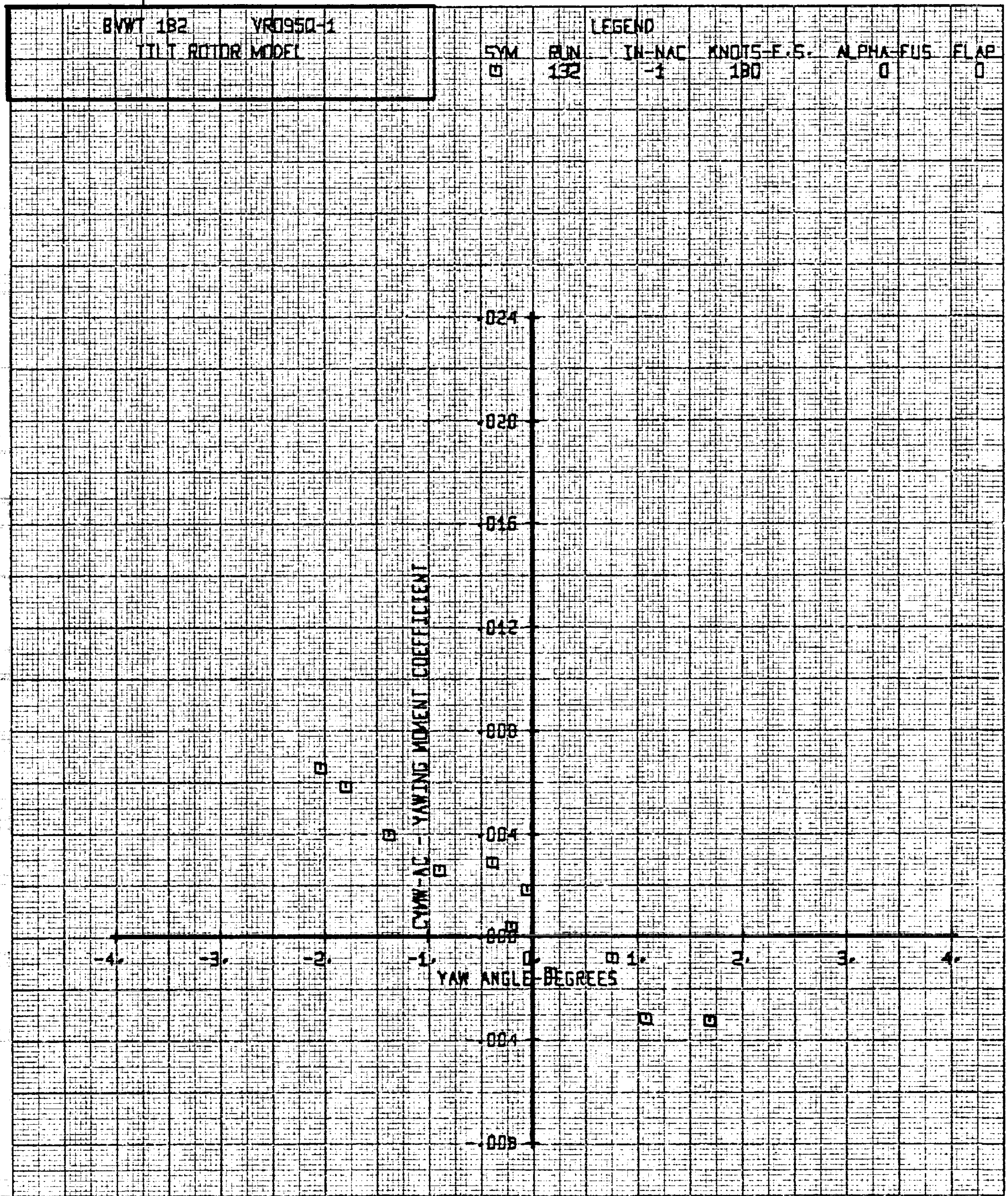


Figure 14-041. Aircraft Yawing Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

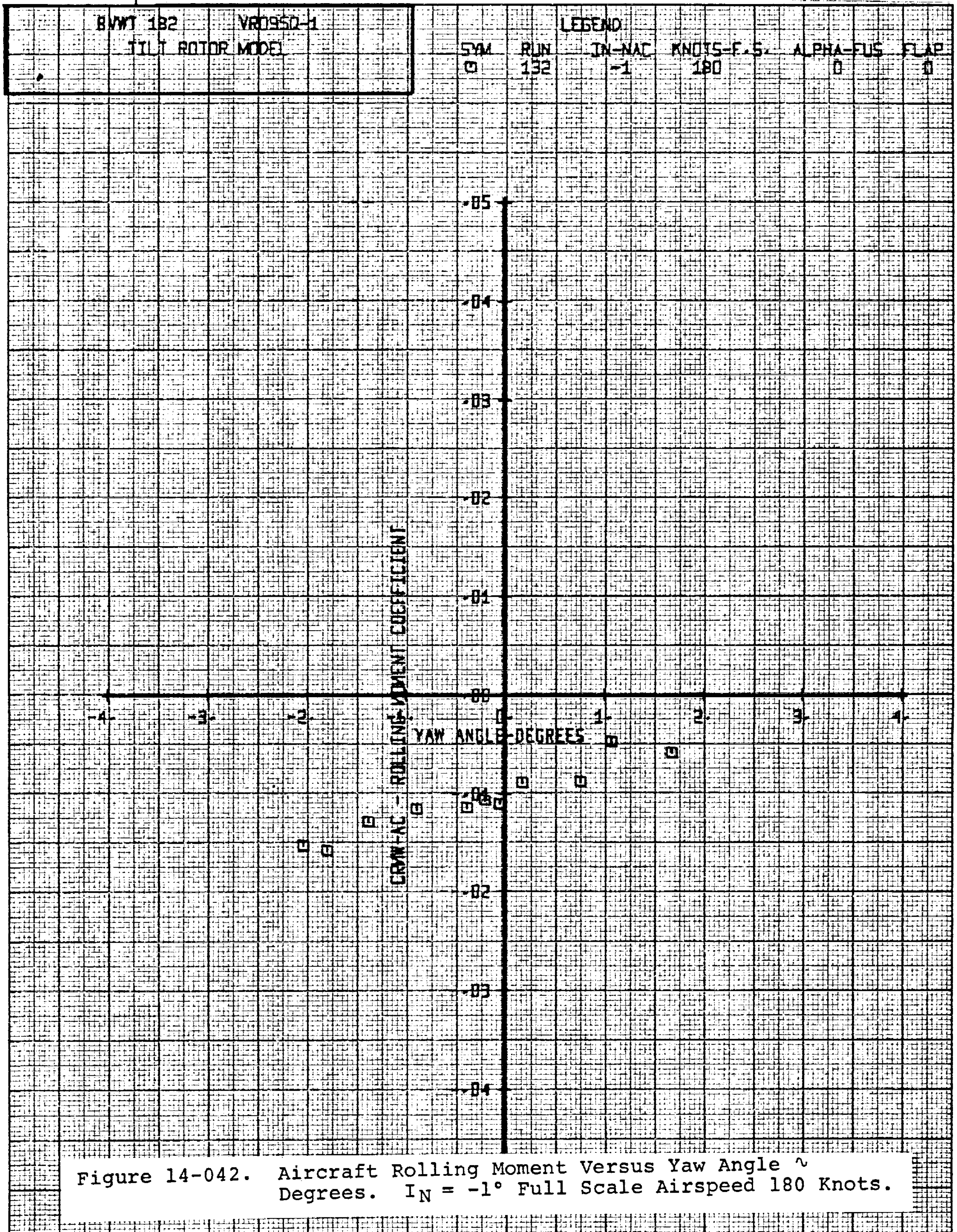


Figure 14-042. Aircraft Rolling Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

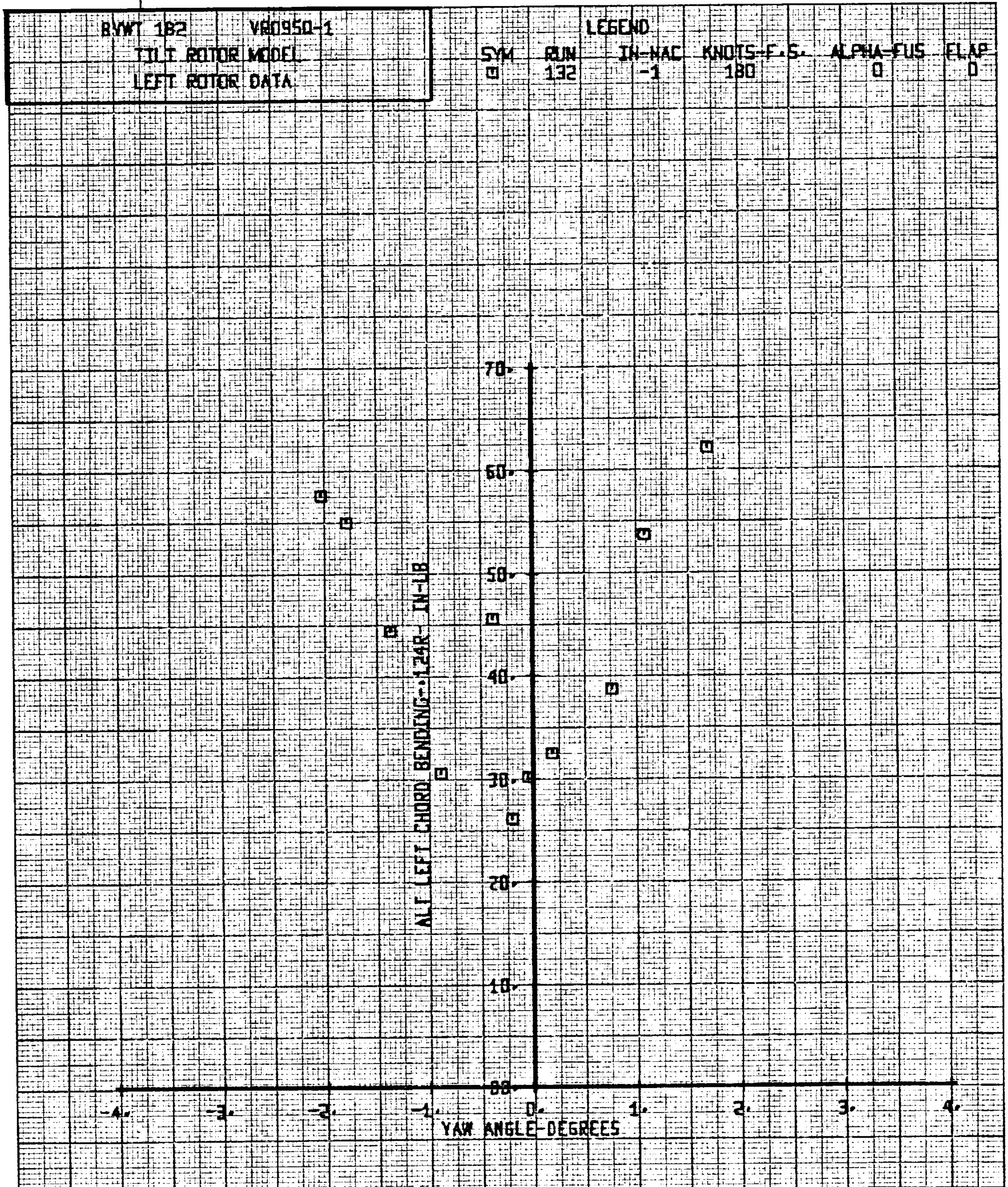


Figure 14-043. Alt. Left Chord Bending Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

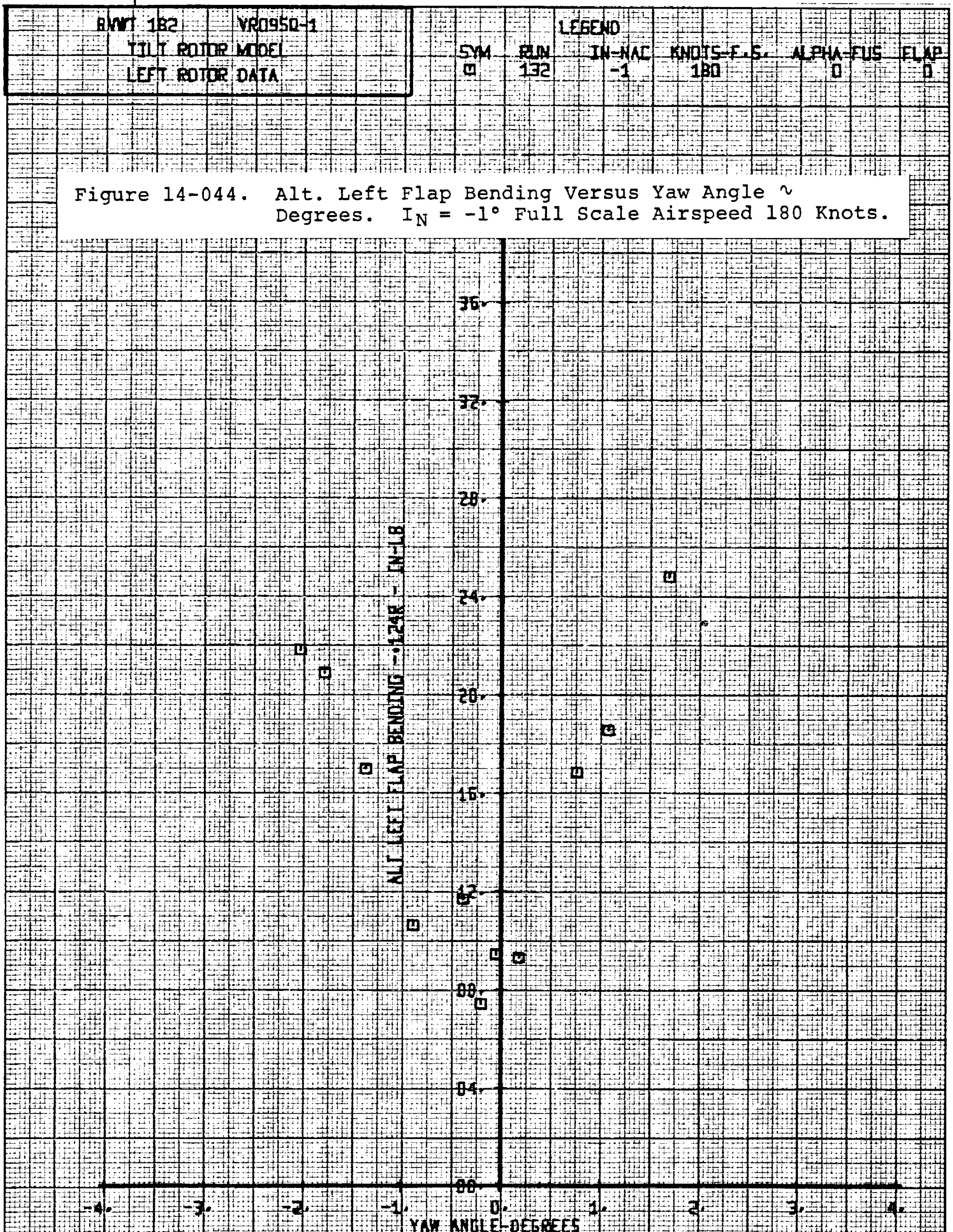


Figure 14-044. Alt. Left Flap Bending Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.

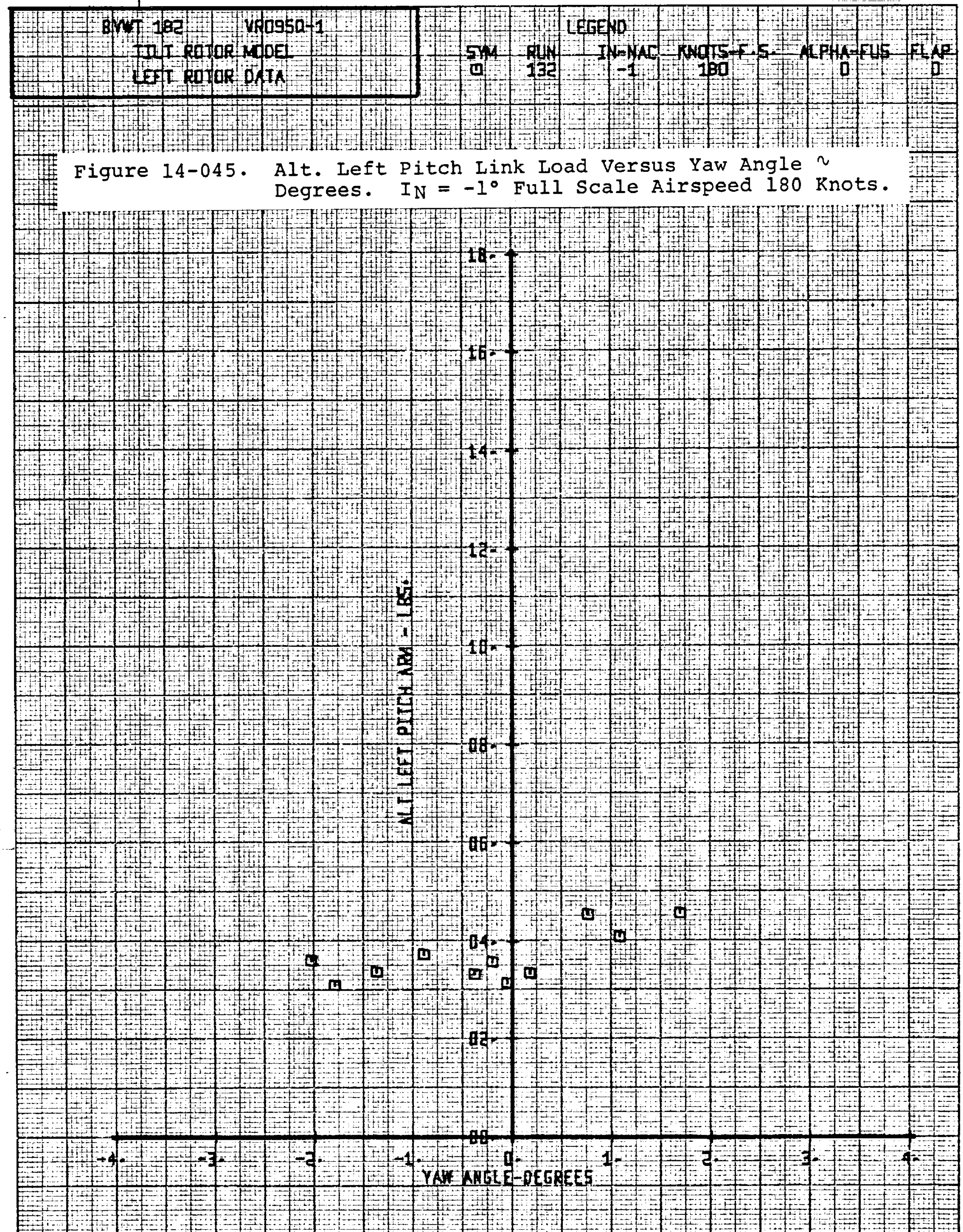


Figure 14-045. Alt. Left Pitch Link Load Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.

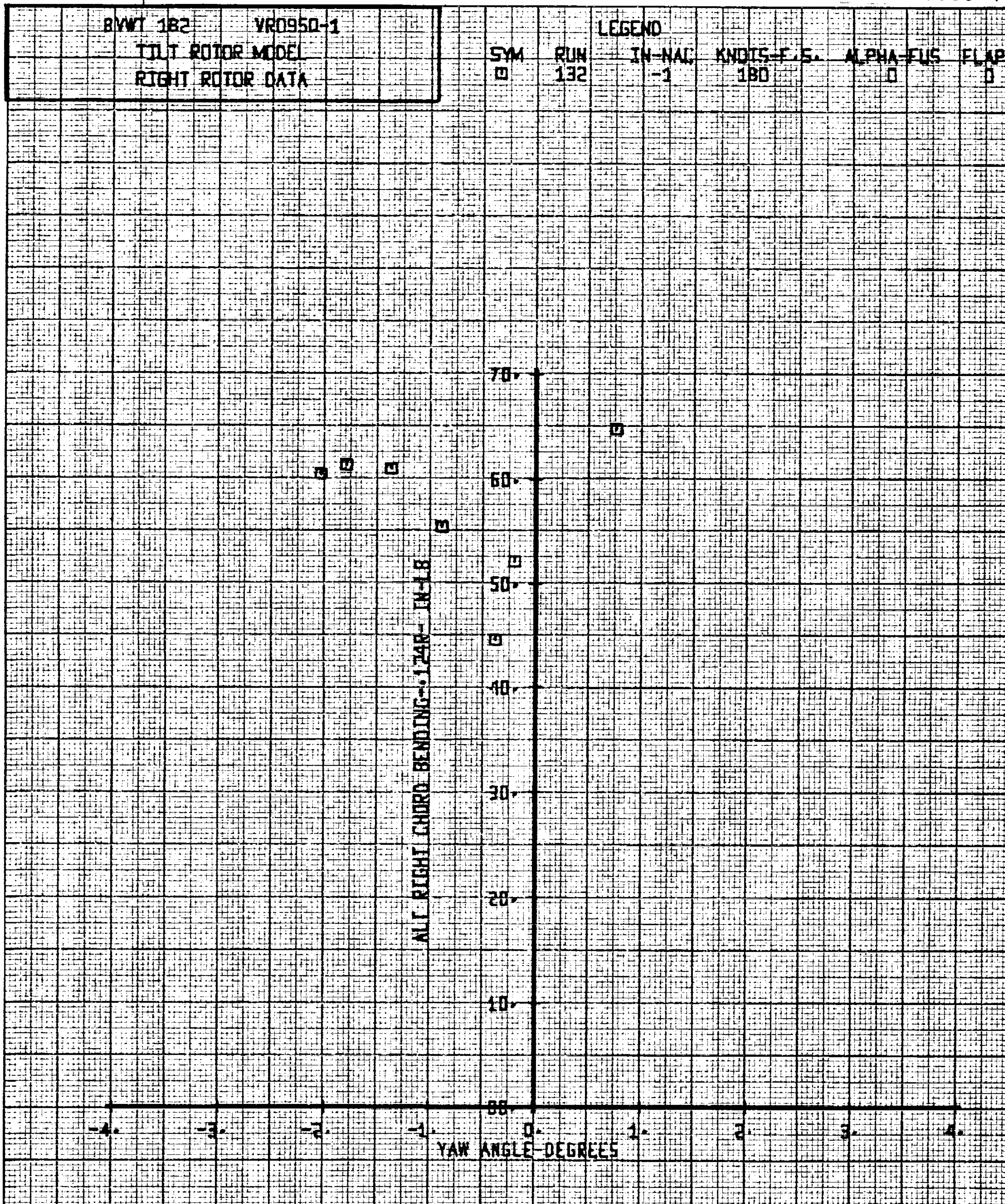


Figure 14-046. Alt. Right Chord Bending Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.

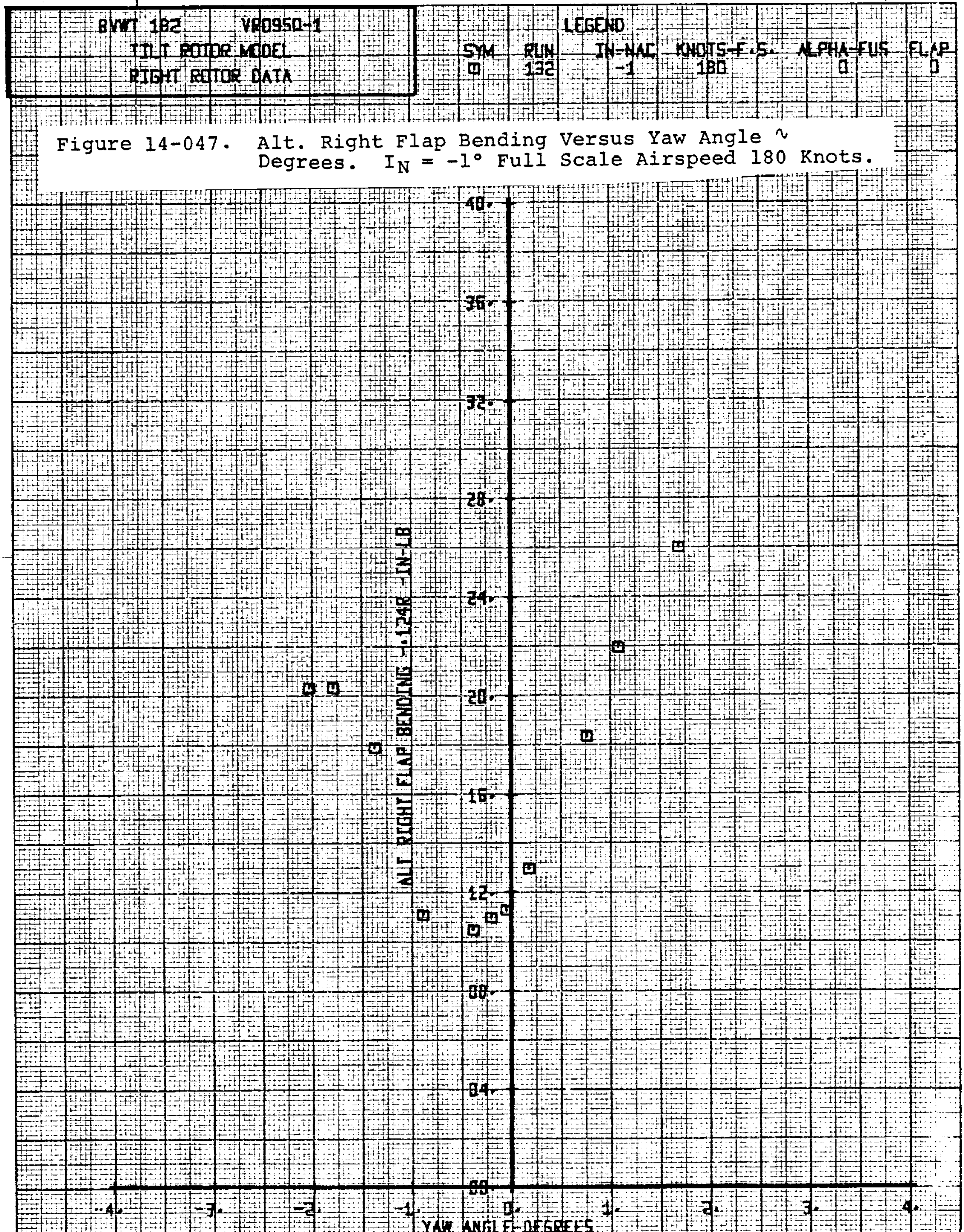


Figure 14-047. Alt. Right Flap Bending Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

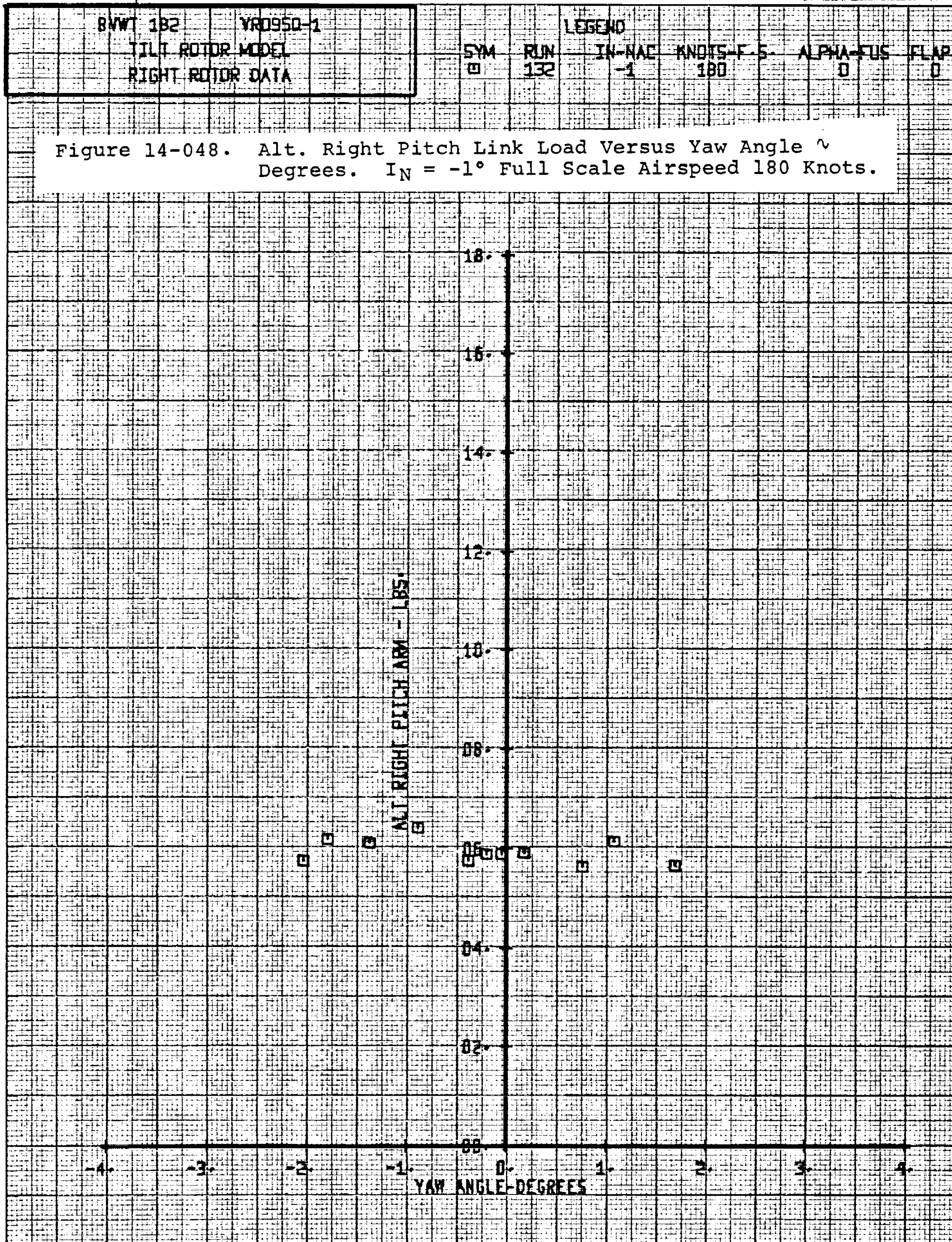


Figure 14-048. Alt. Right Pitch Link Load Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.

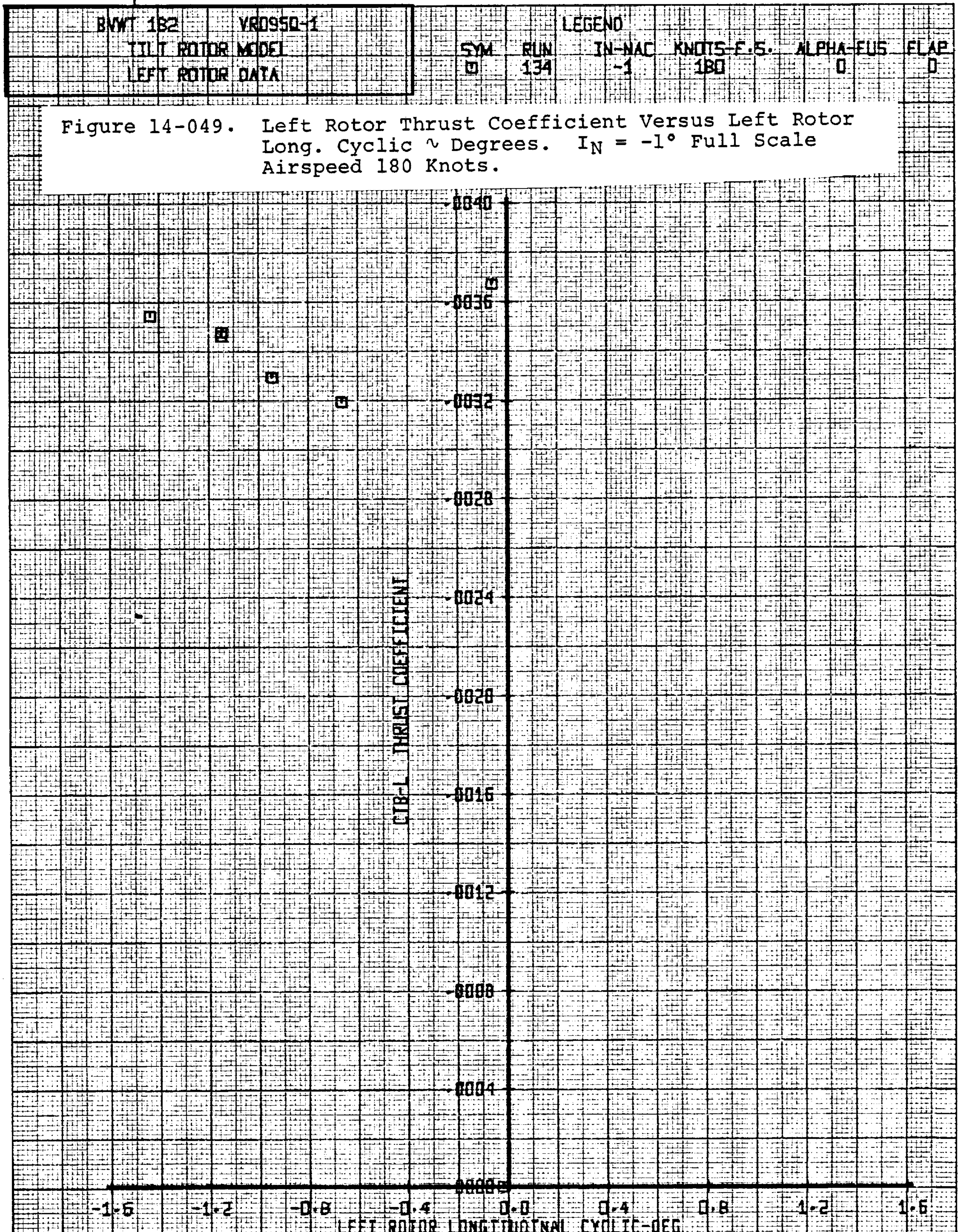


Figure 14-049. Left Rotor Thrust Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

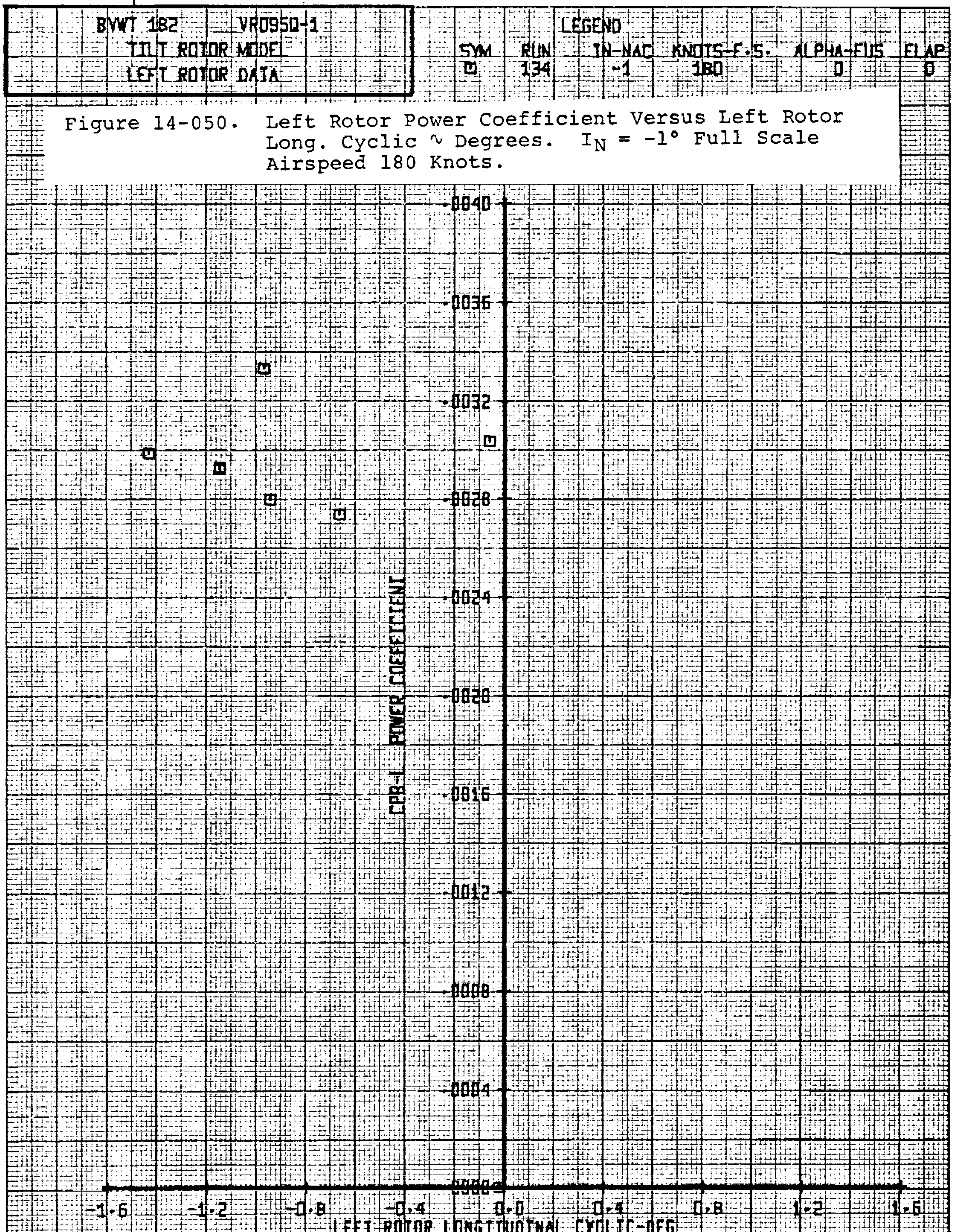


Figure 14-050. Left Rotor Power Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

BB
182

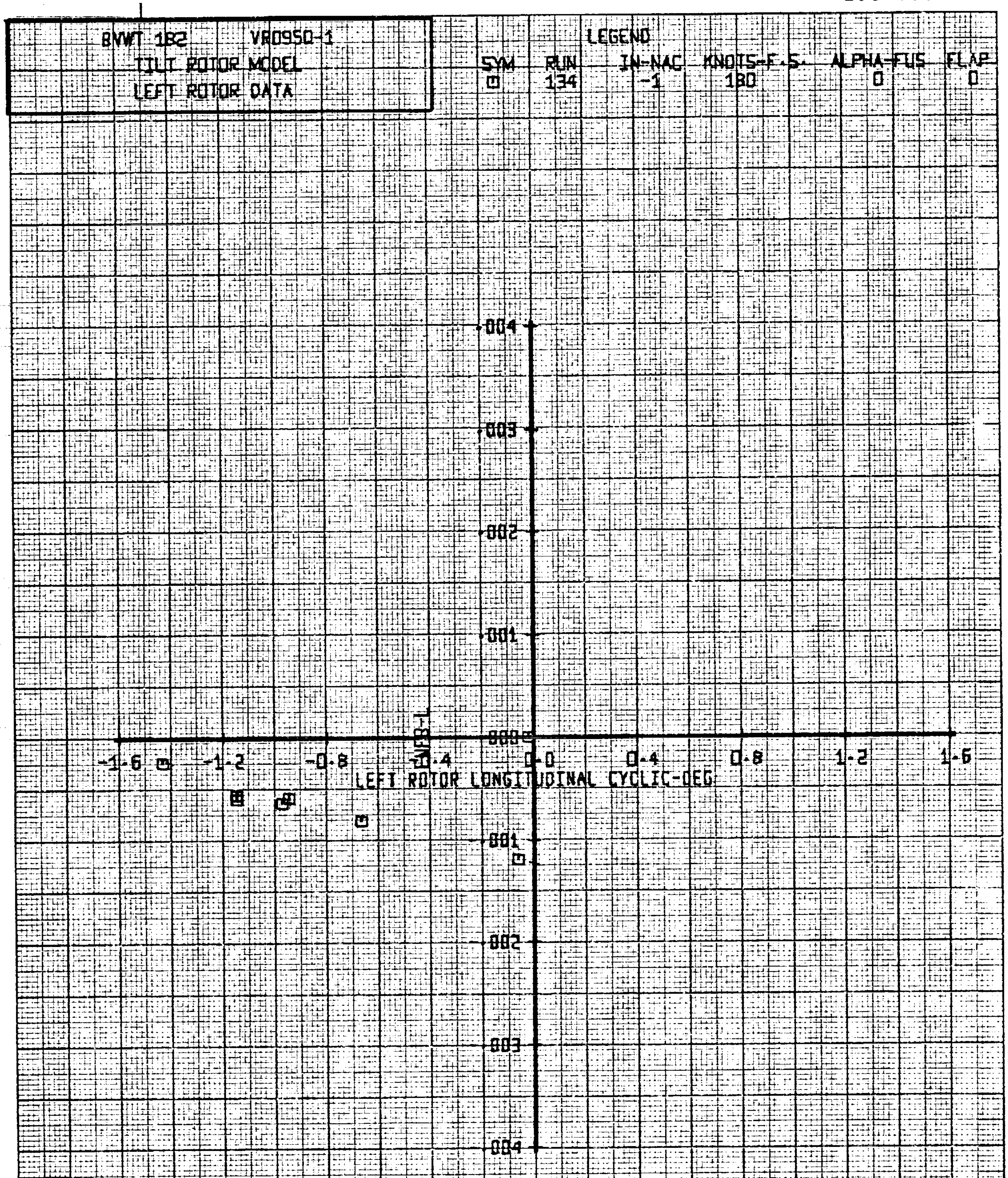


Figure 14-051. Left Rotor Normal Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

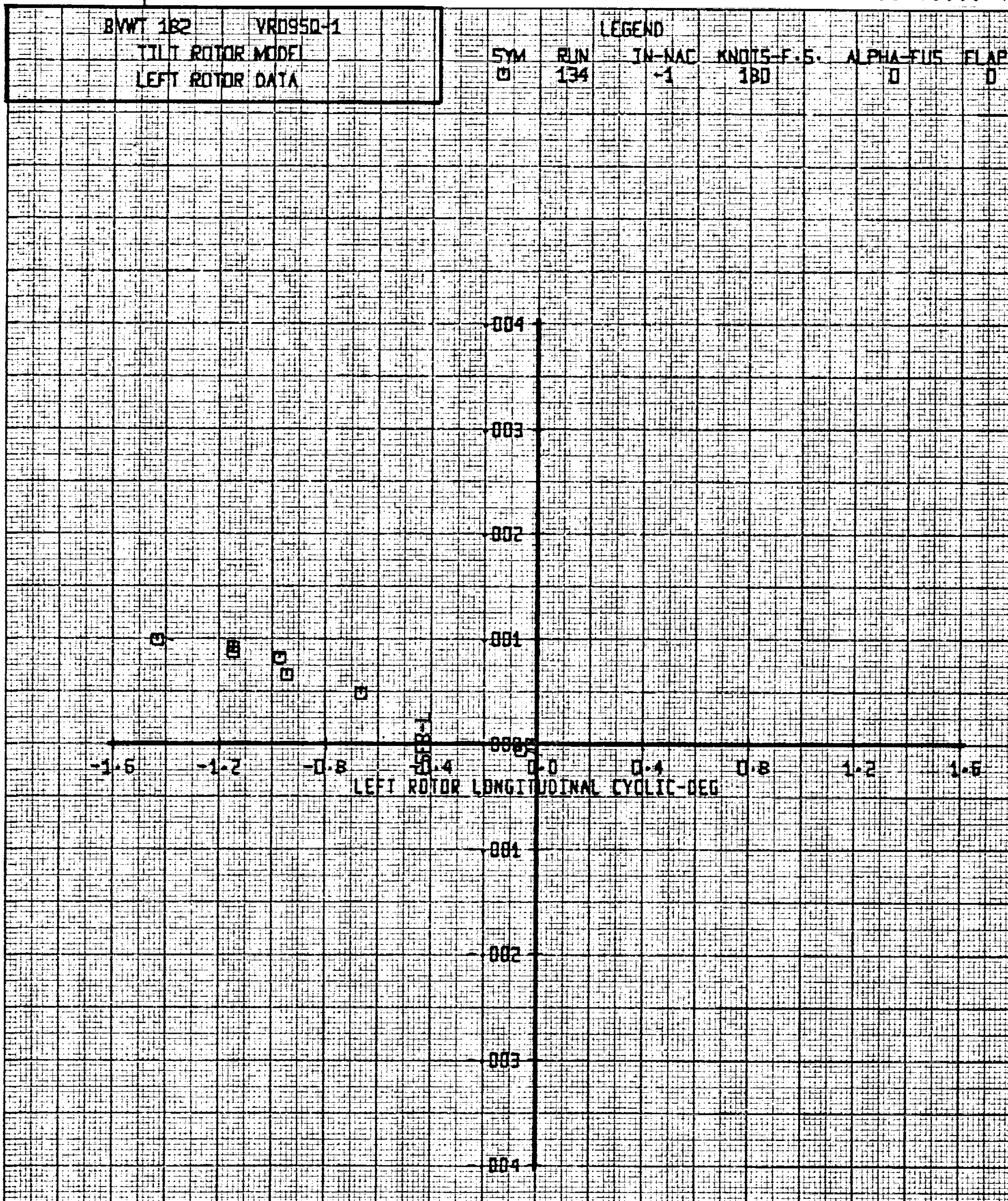


Figure 14-052. Left Rotor Side Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

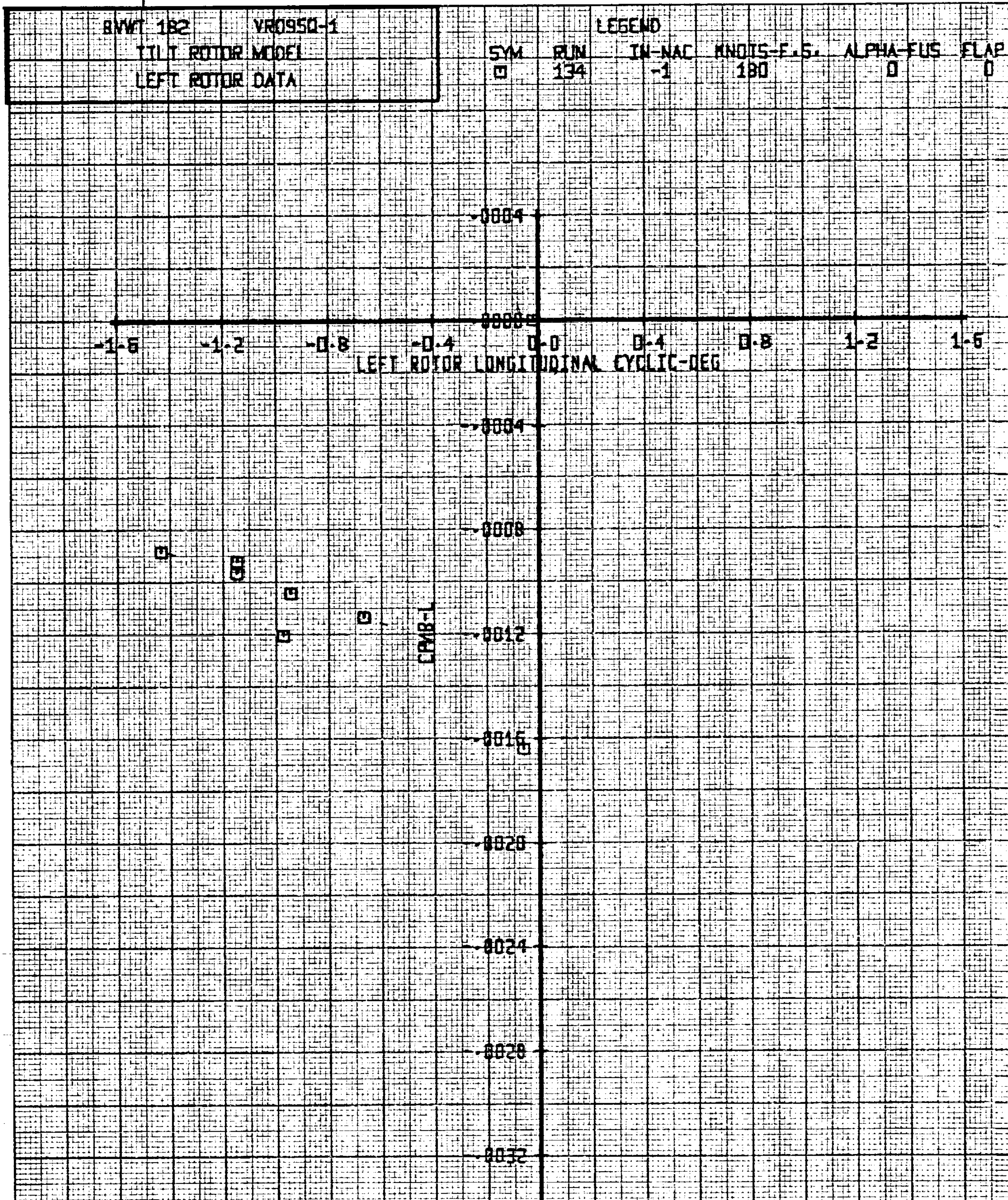


Figure 14-053. Left Rotor Pitching Moment Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

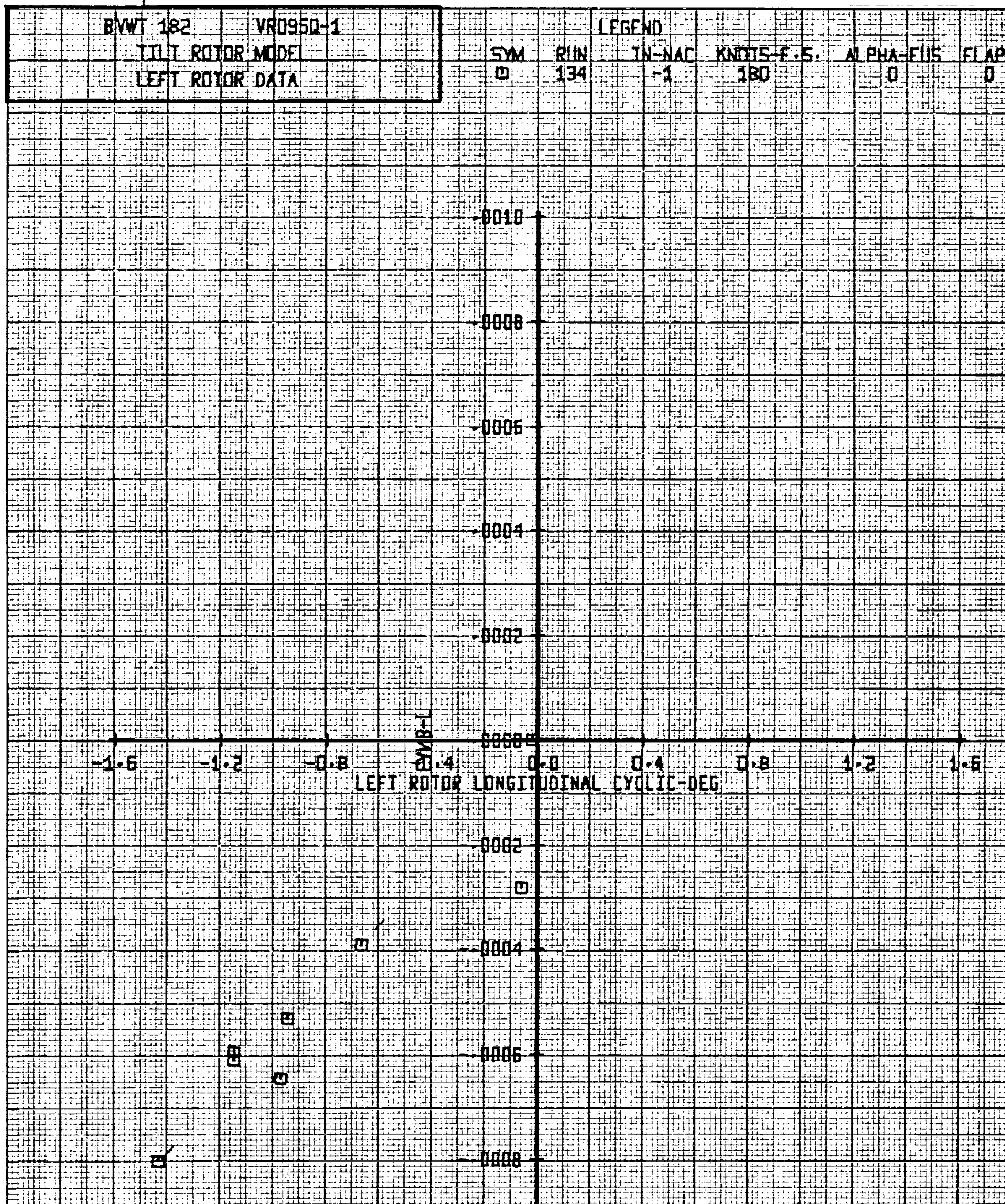


Figure 14-054. Left Rotor Yawing Moment Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = −1° Full Scale Airspeed 180 Knots.

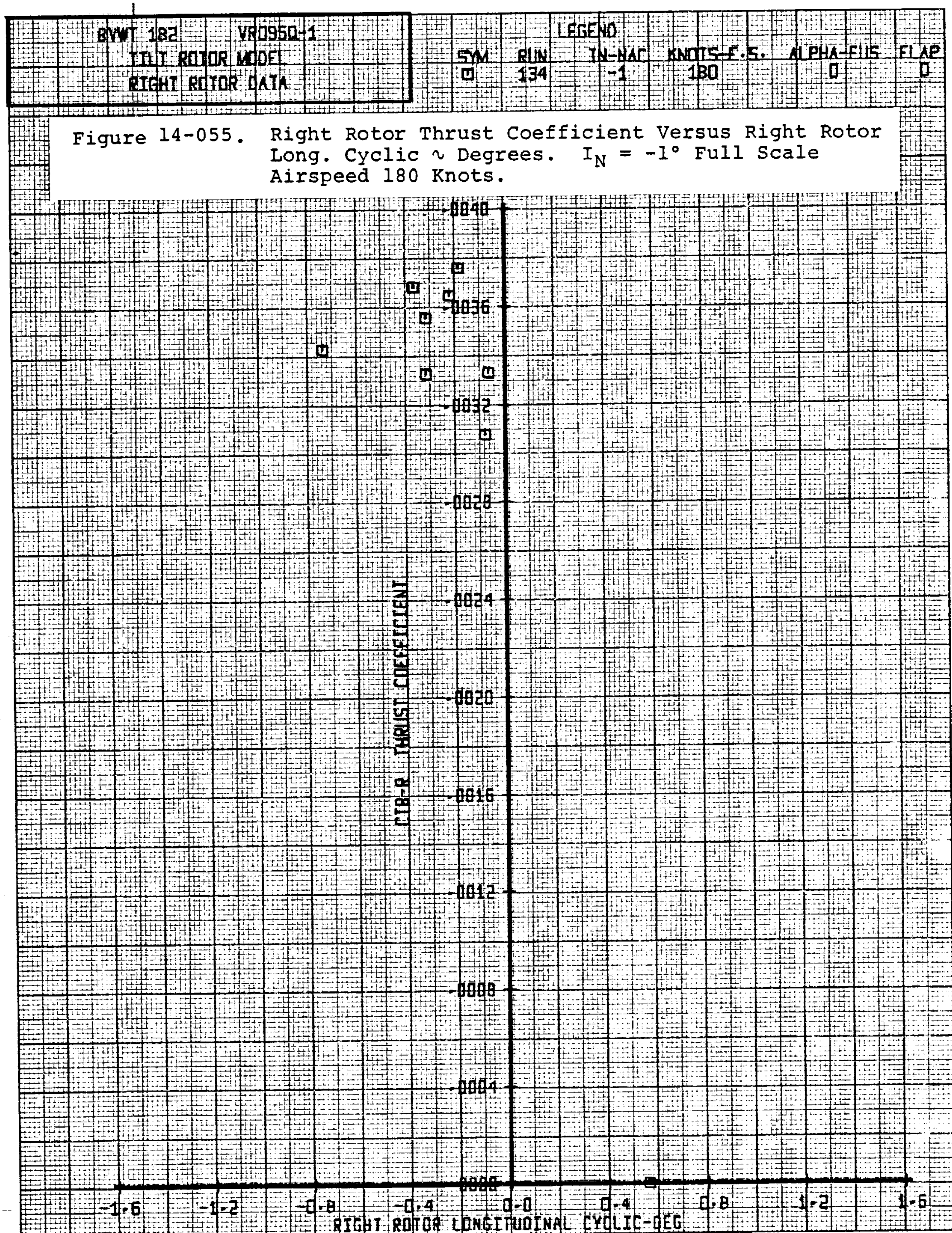


Figure 14-055. Right Rotor Thrust Coefficient Versus Right Rotor Long. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

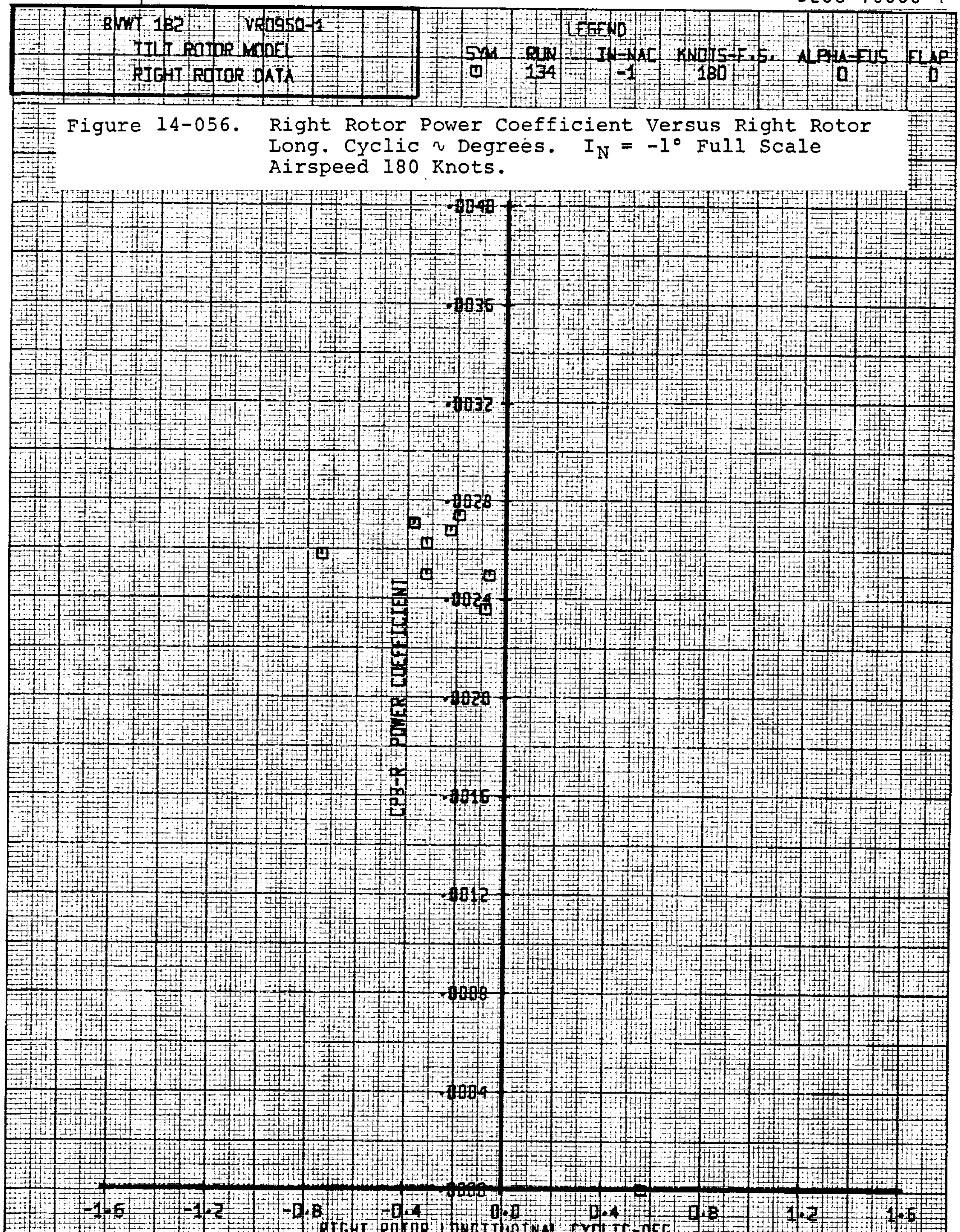


Figure 14-056. Right Rotor Power Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

BB
182

SET BB
BVWT 182

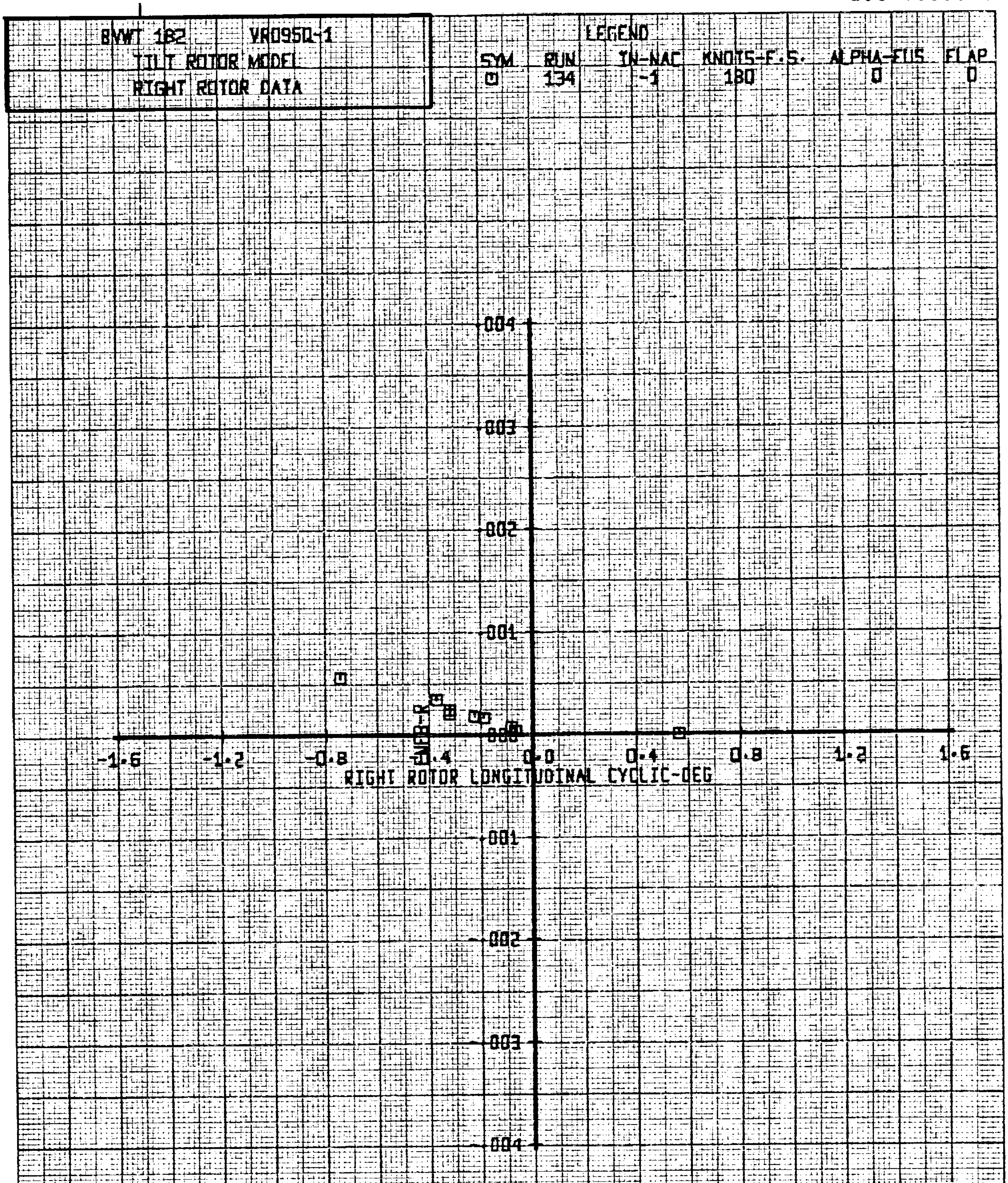


Figure 14-057. Right Rotor Normal Force Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

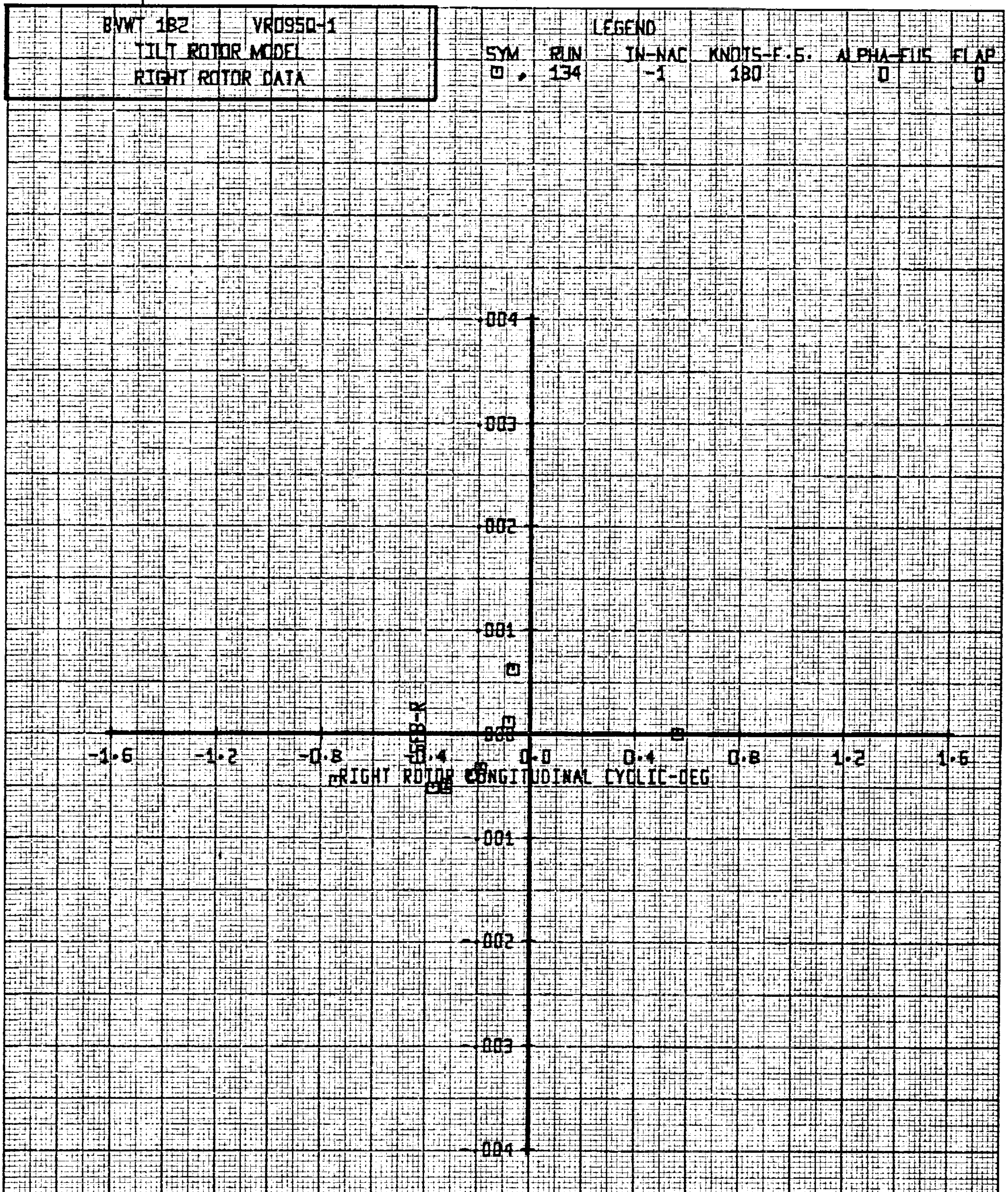


Figure 14-058. Right Rotor Side Force Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

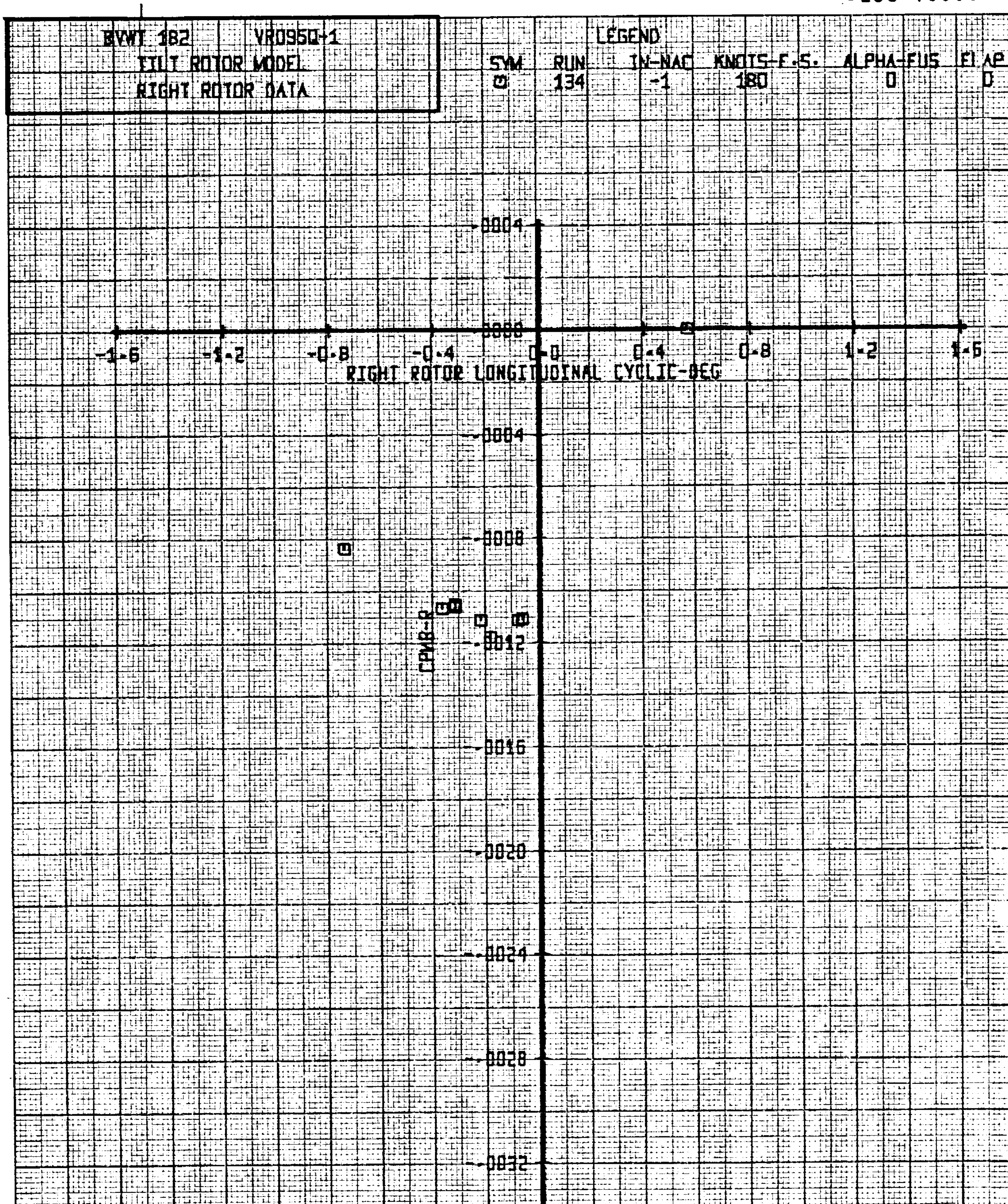


Figure 14-059. Right Rotor Pitching Moment Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

SET BB
BVWT 182

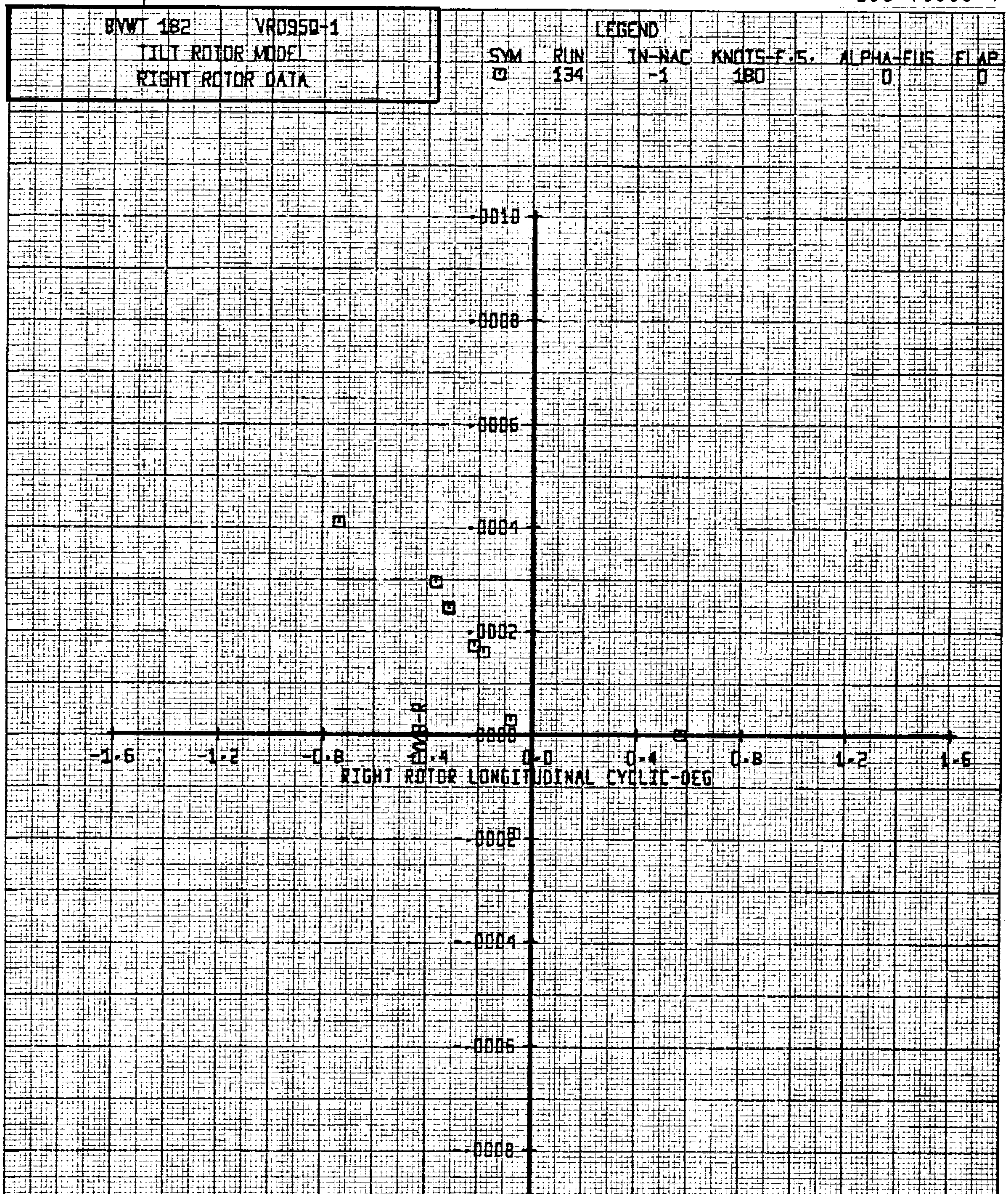
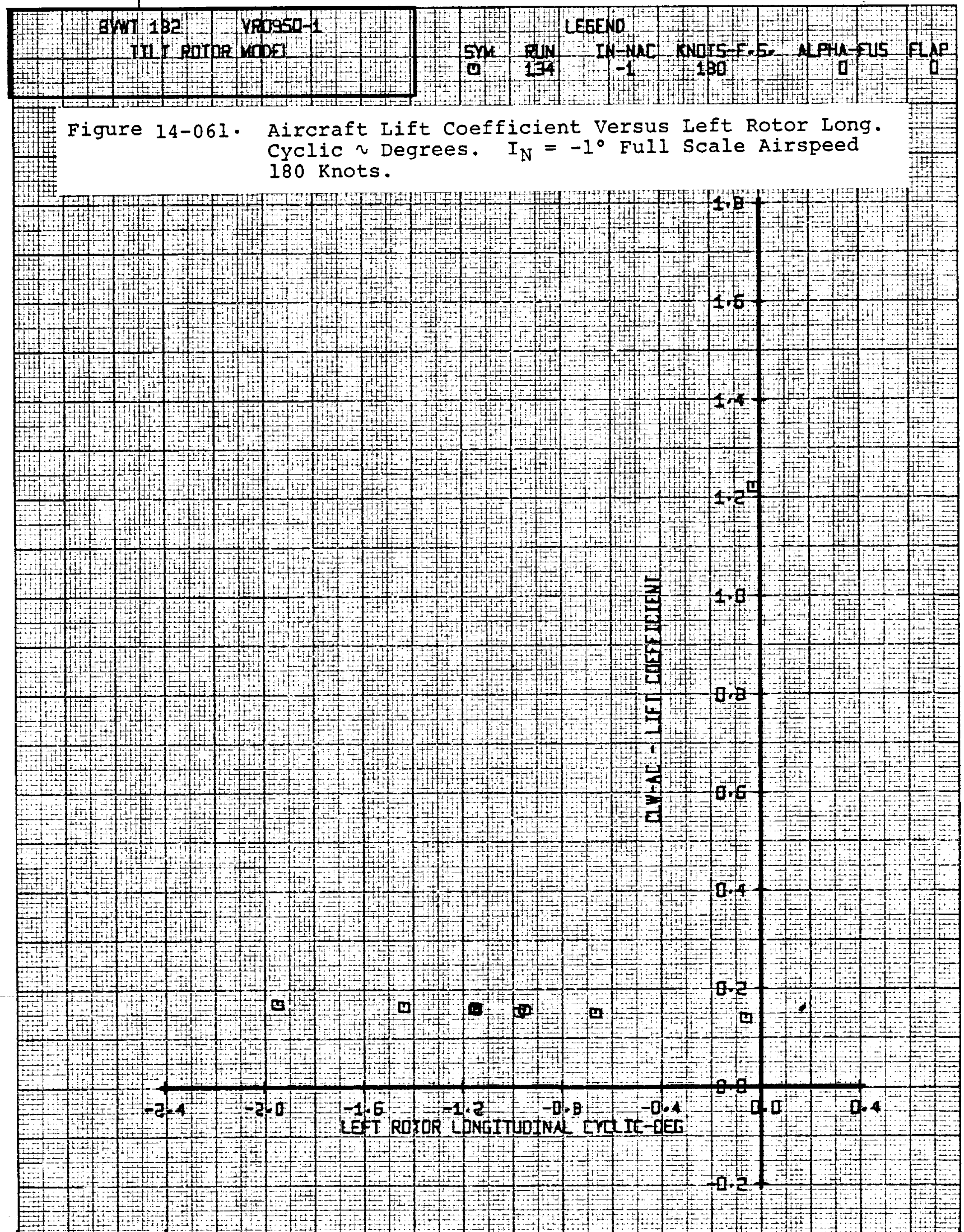


Figure 14-060. Right Rotor Yawing Moment Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

Figure 14-061. Aircraft Lift Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.



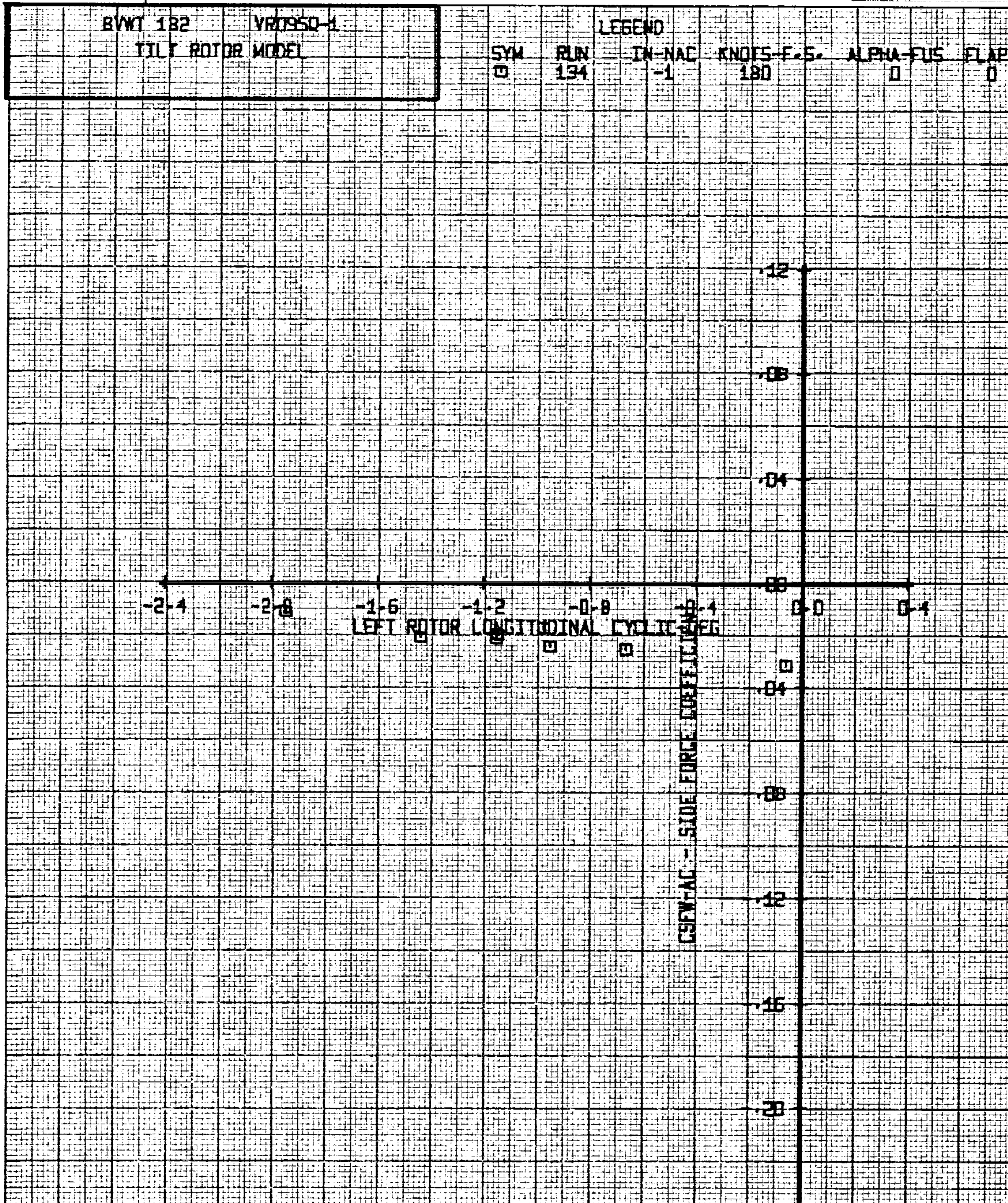


Figure 14-062. Aircraft Side Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

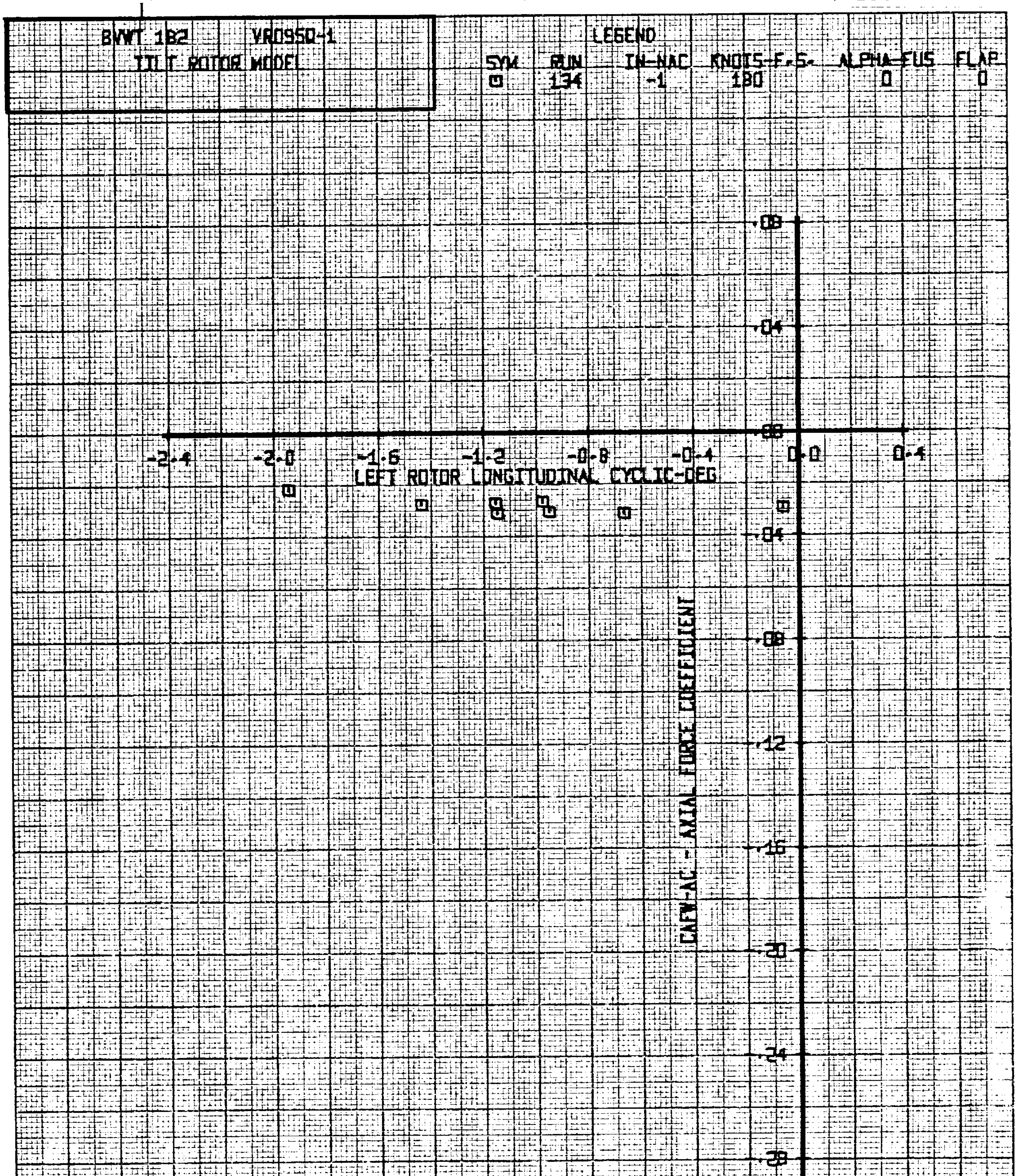


Figure 14-063. Aircraft Axial Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

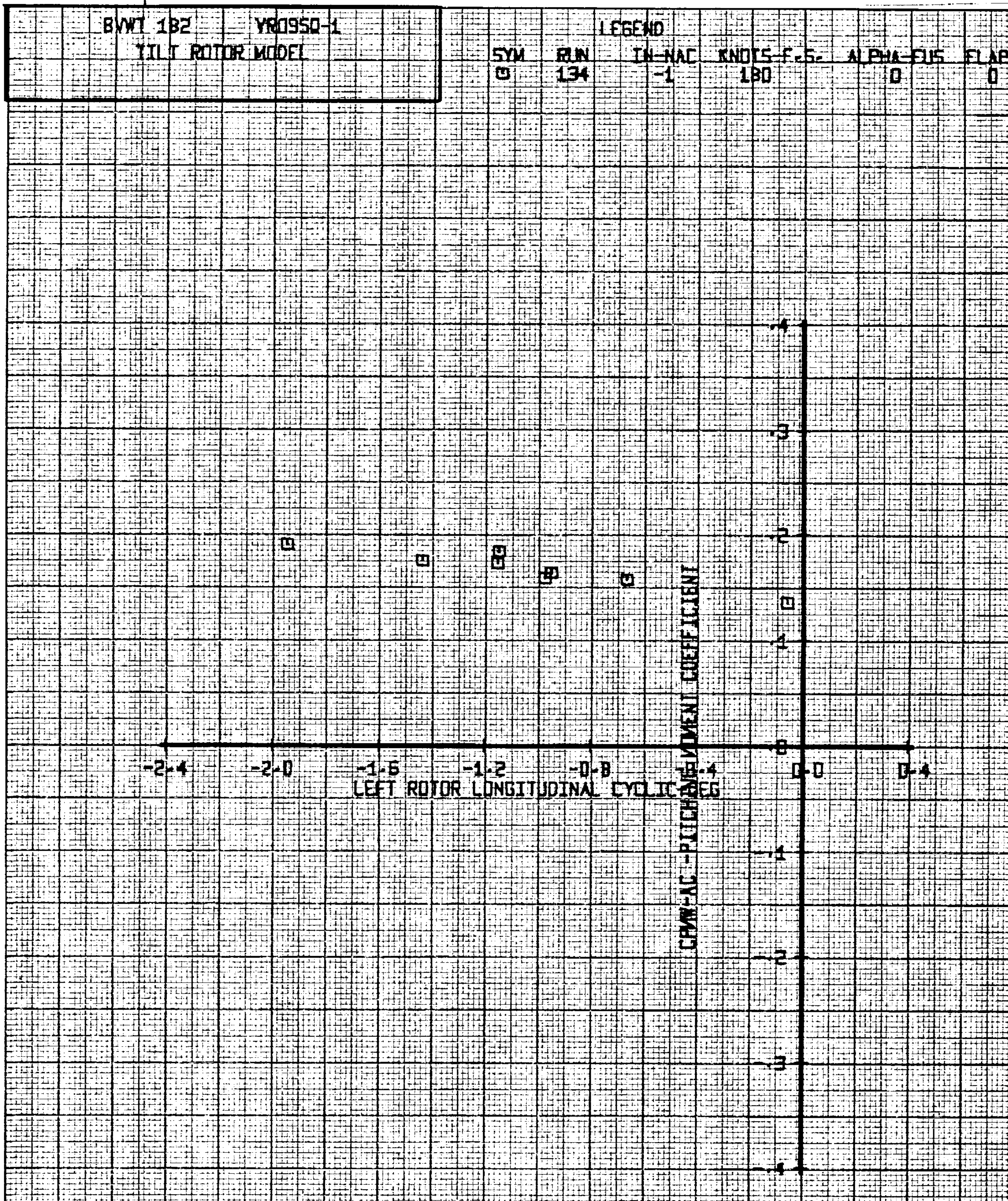


Figure 14-064. Aircraft Pitching Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

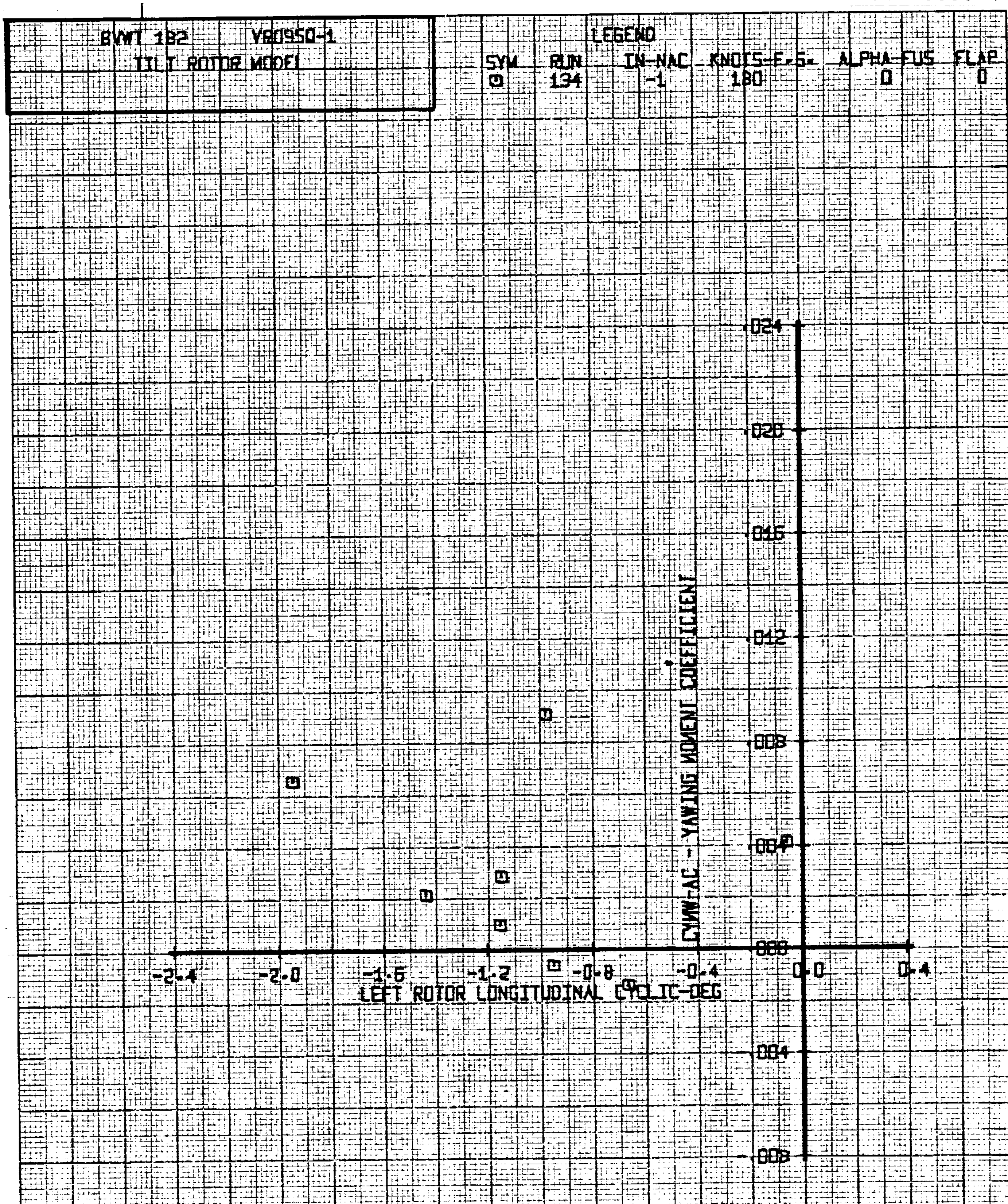


Figure 14-065. Aircraft Yawing Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

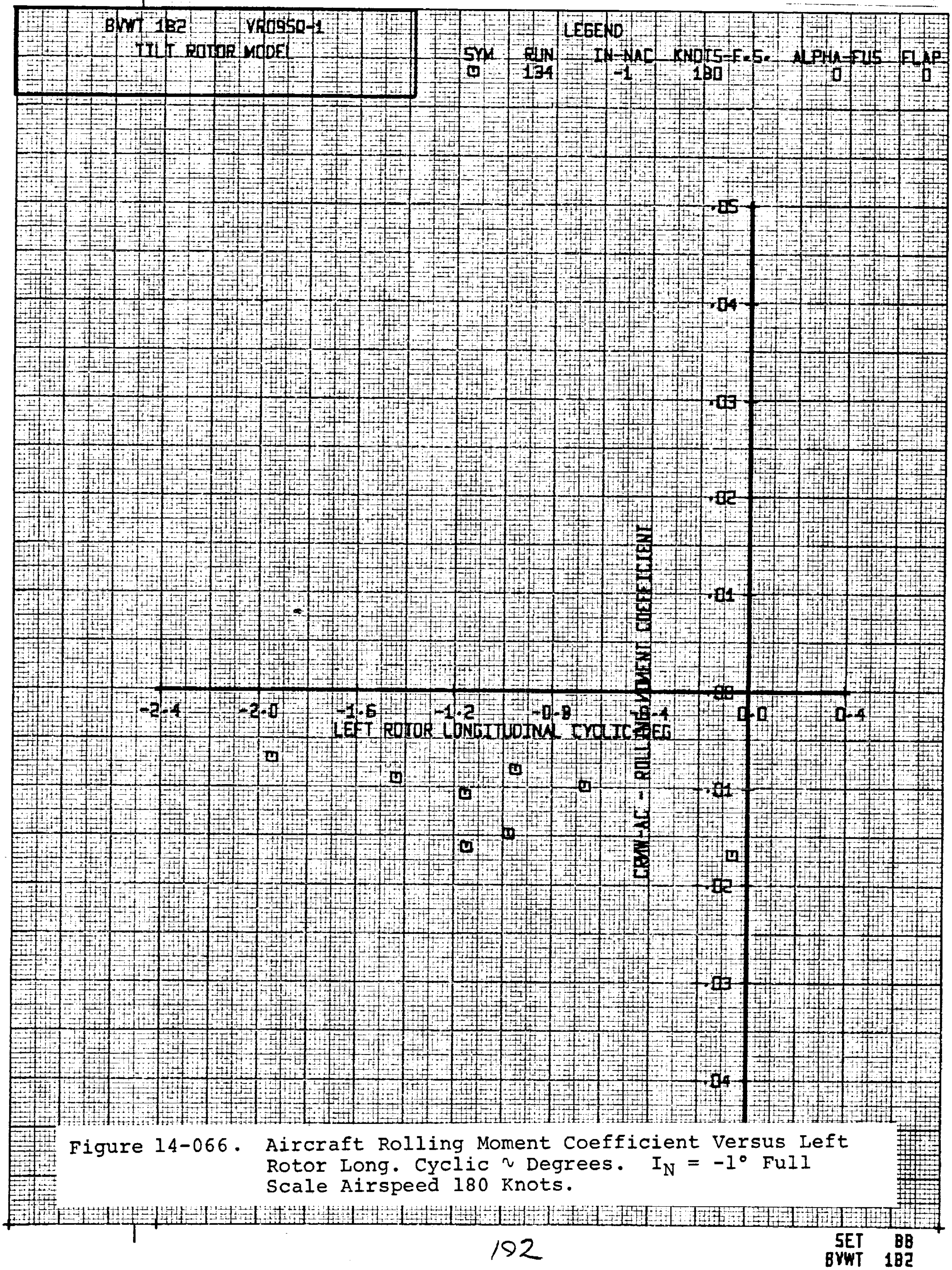


Figure 14-066. Aircraft Rolling Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

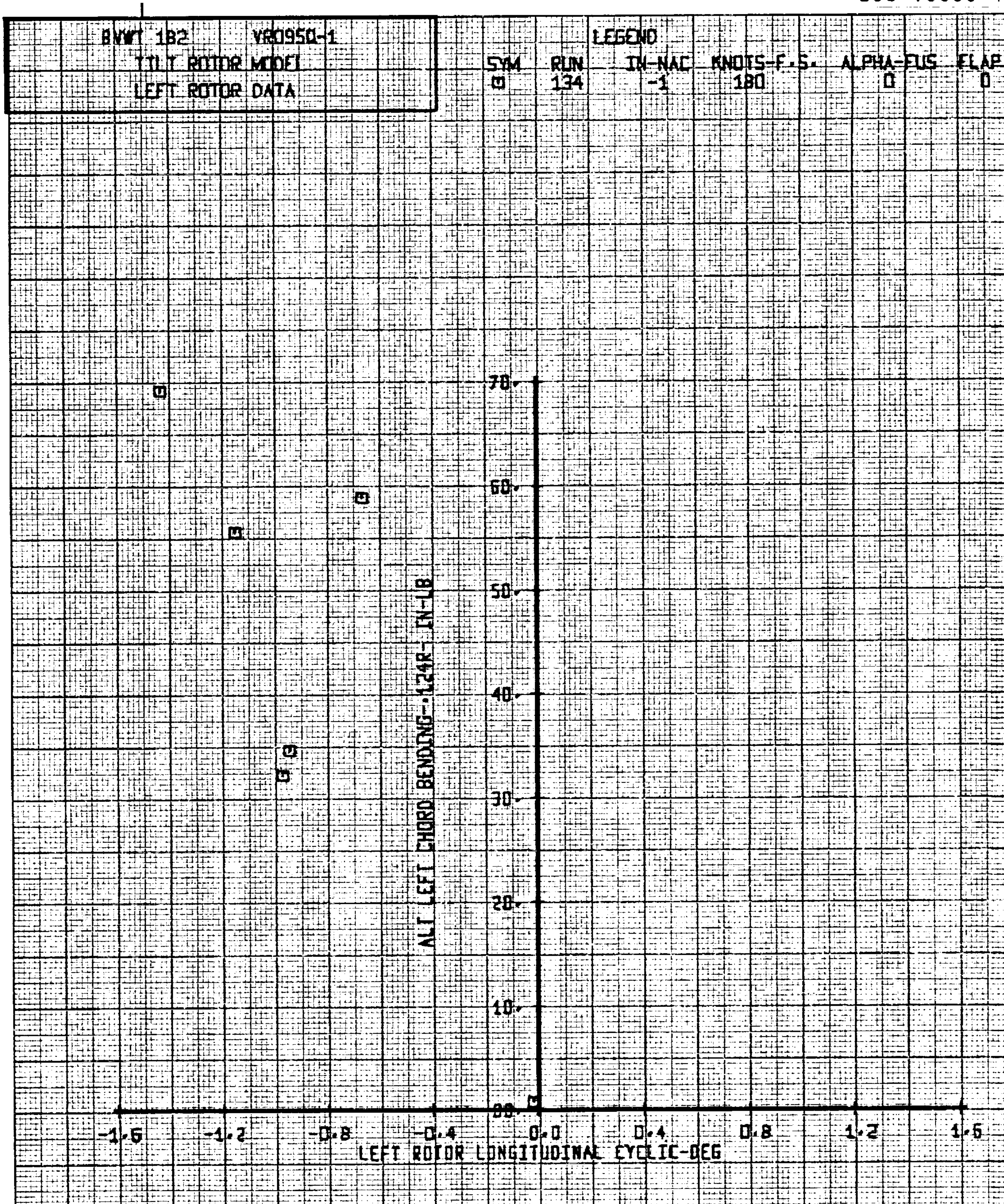


Figure 14-067. Alt. Left Chord Bending Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

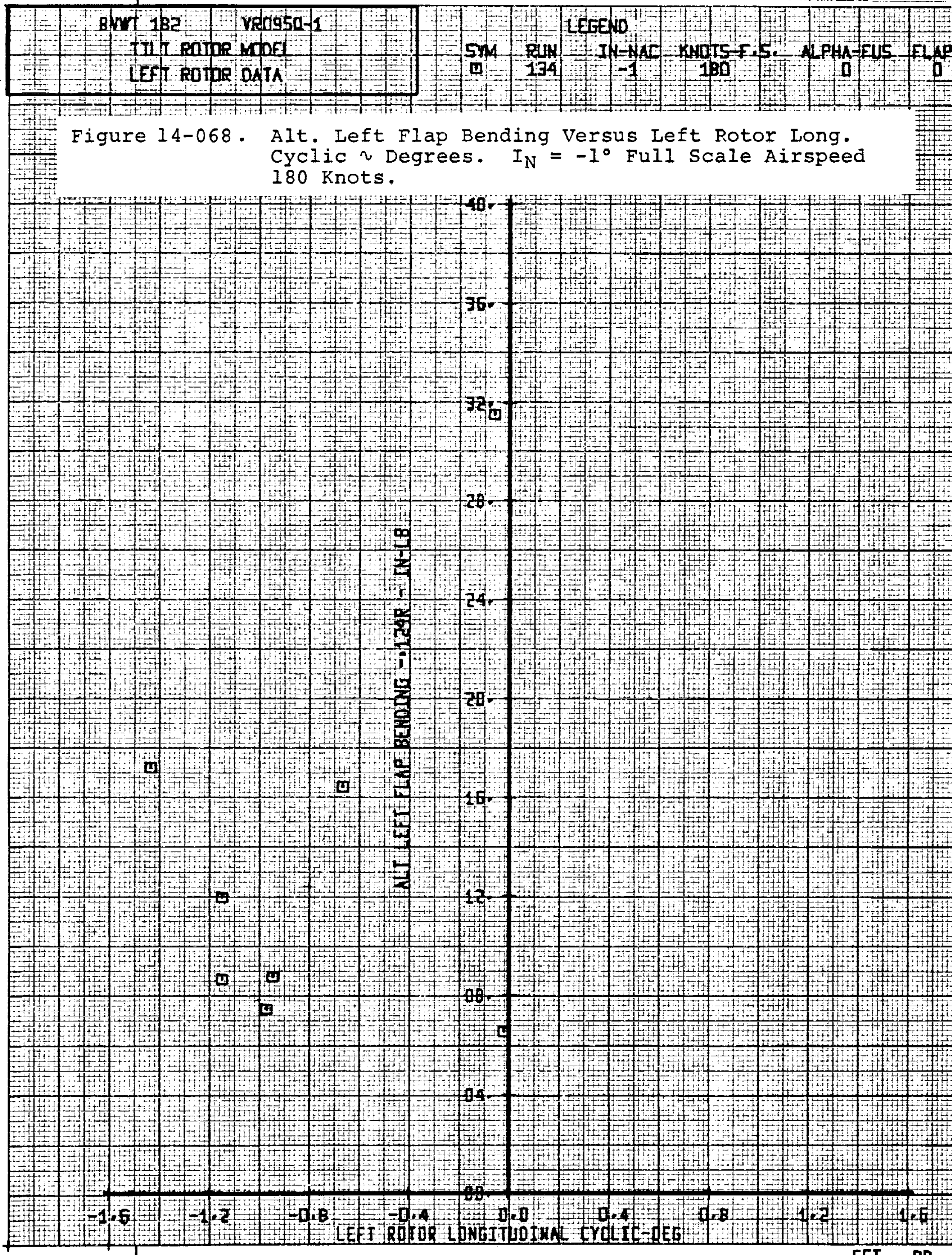


Figure 14-068. Alt. Left Flap Bending Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

BB
1B2

SET BB
BVWT 1B2

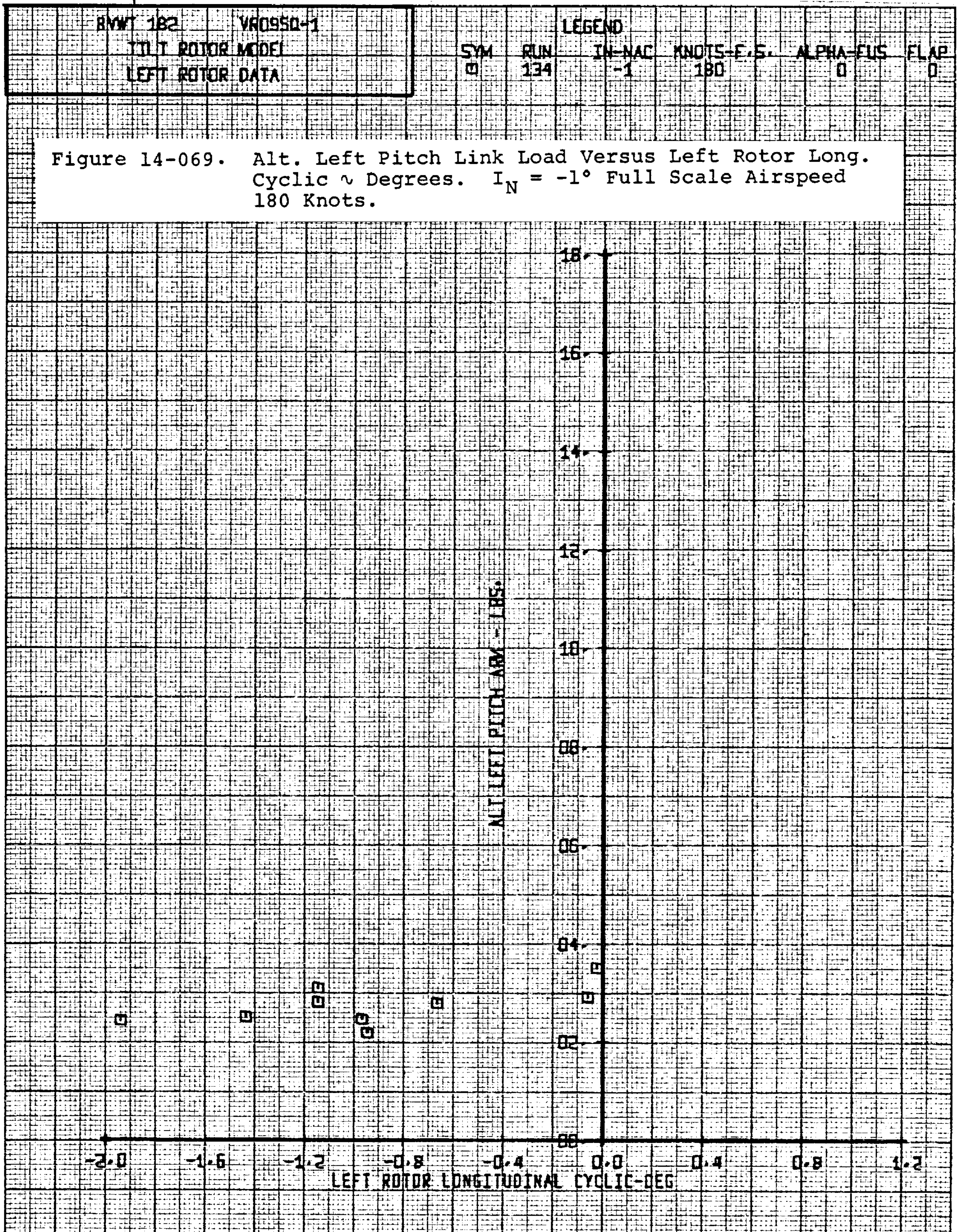


Figure 14-069. Alt. Left Pitch Link Load Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.

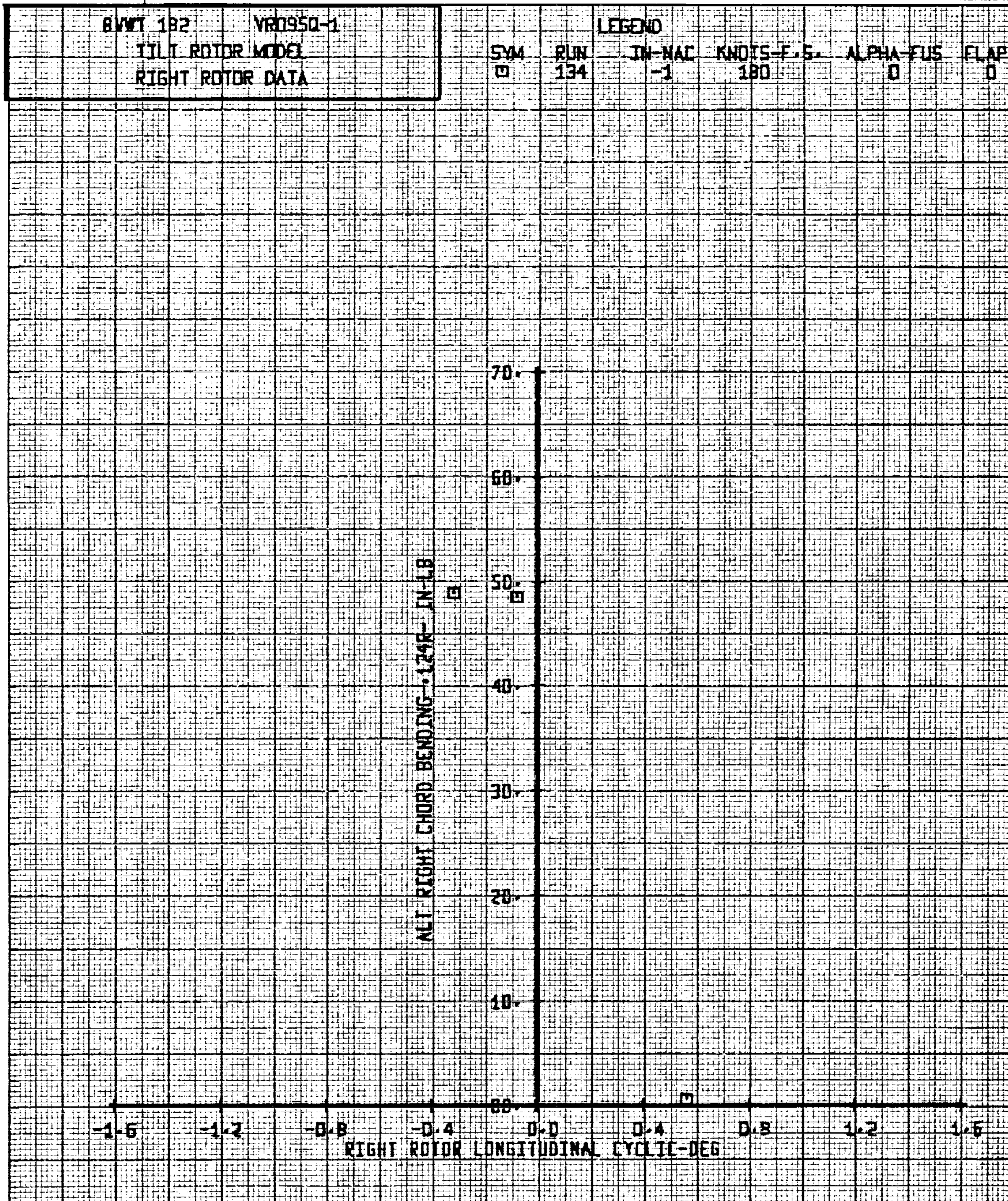


Figure 14-070. Alt. Right Chord Bending Versus Right Rotor Long. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

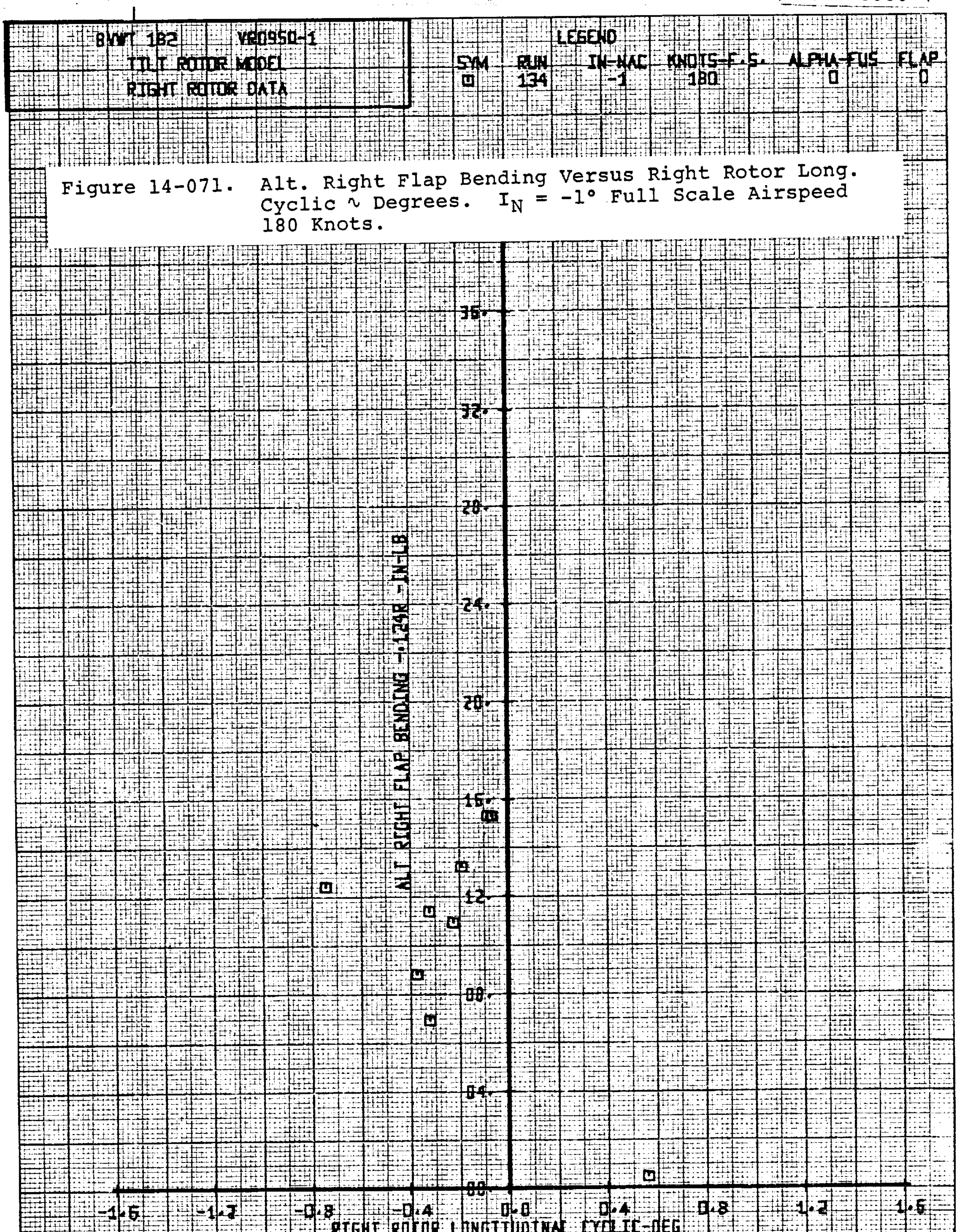
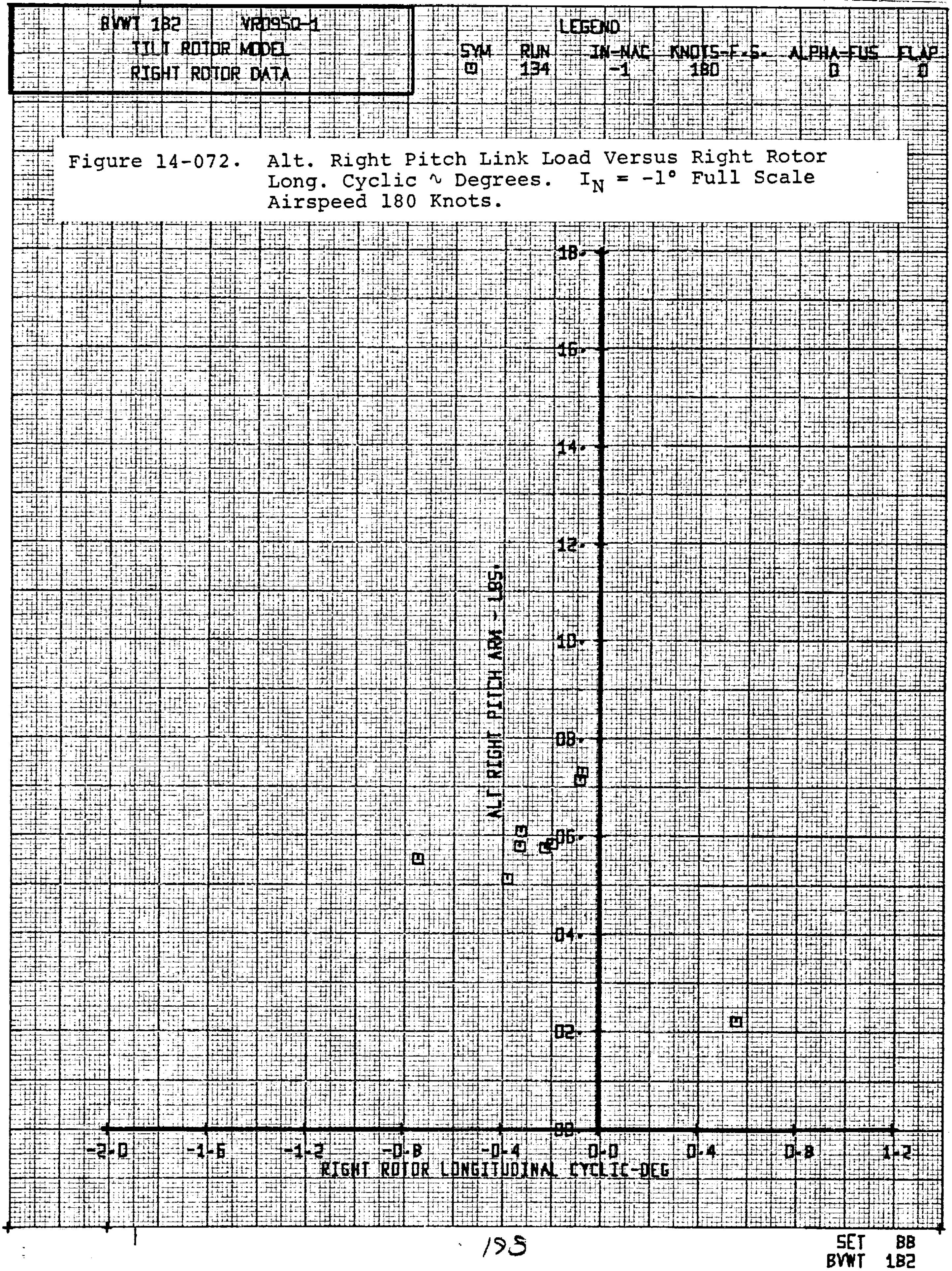


Figure 14-071. Alt. Right Flap Bending Versus Right Rotor Long. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

ET 88
WT 182

SET 88
BVWT 182

Figure 14-072. Alt. Right Pitch Link Load Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.



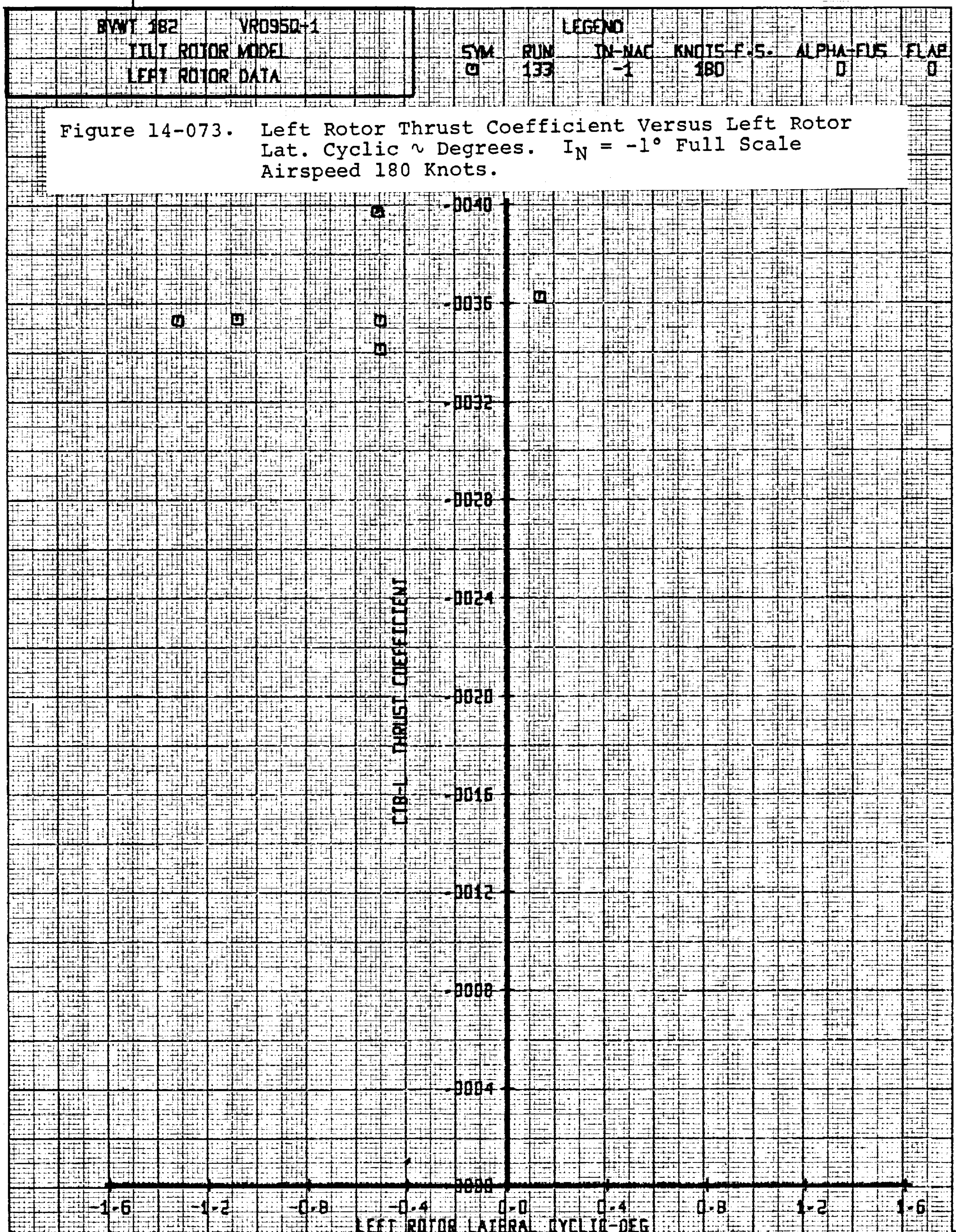


Figure 14-073. Left Rotor Thrust Coefficient Versus Left Rotor Lat. Cyclic ~ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.

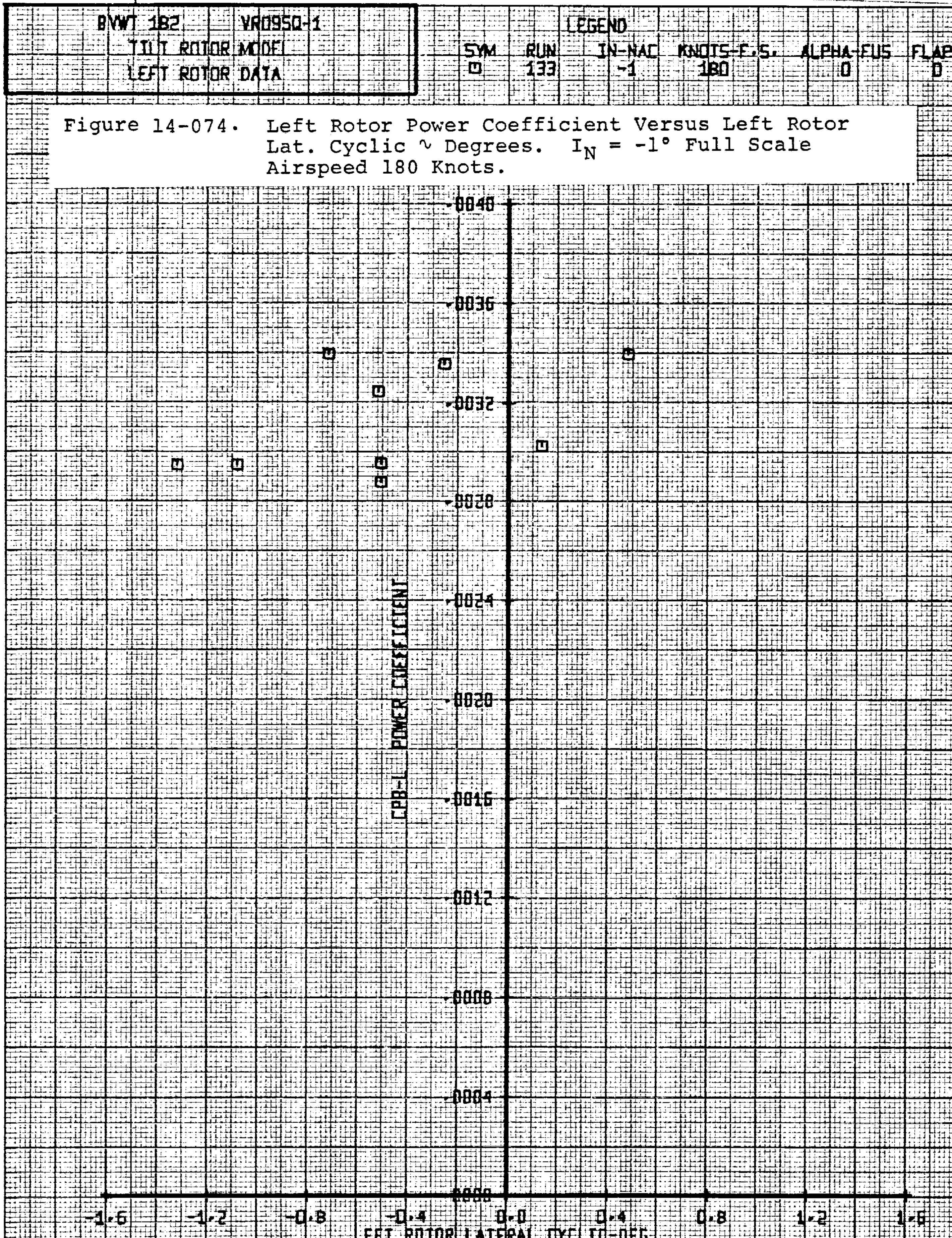


Figure 14-074. Left Rotor Power Coefficient Versus Left Rotor Lat. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

B7
182

SET B7
BVWT 182

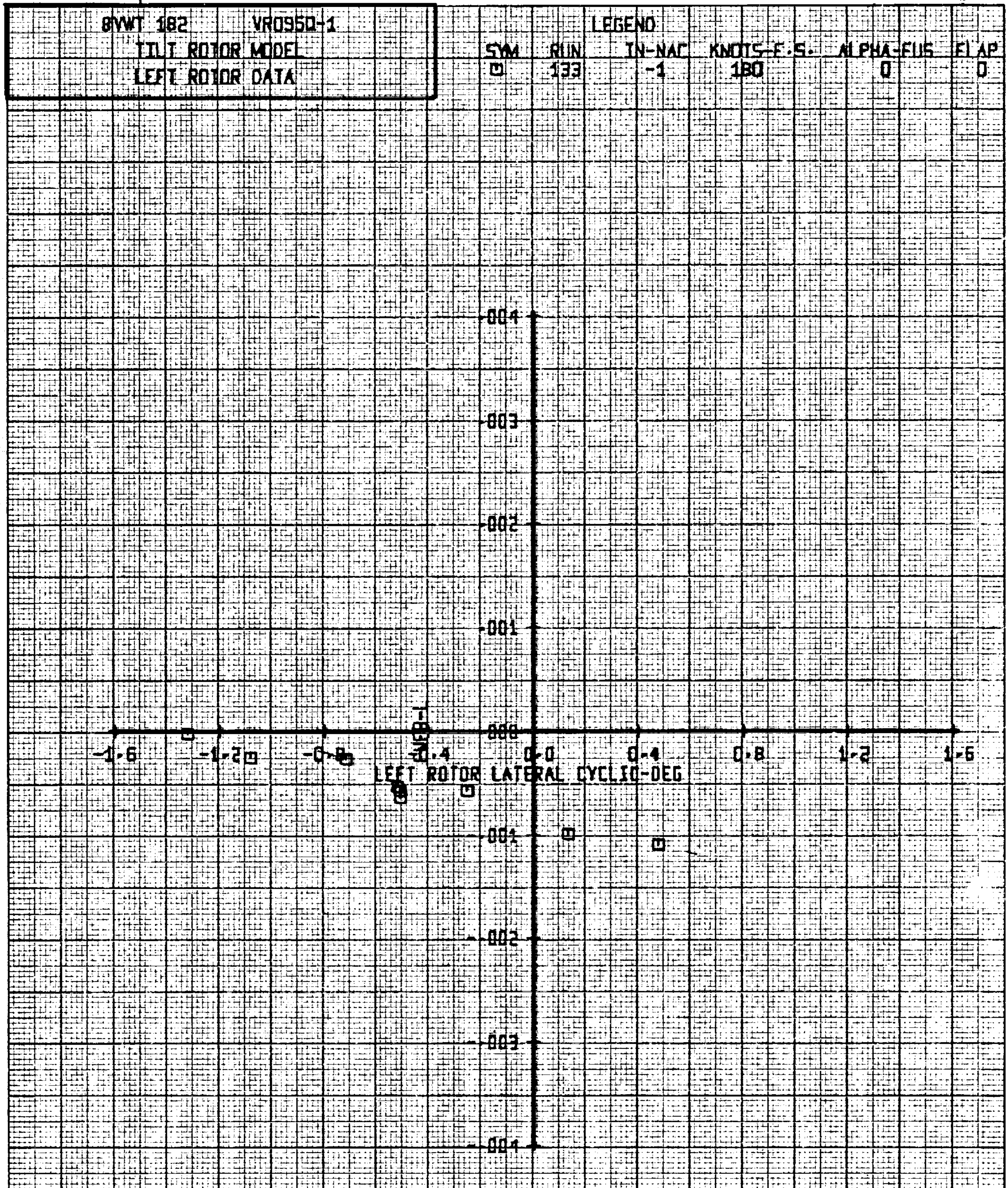


Figure 14-075. Left Rotor Normal Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.

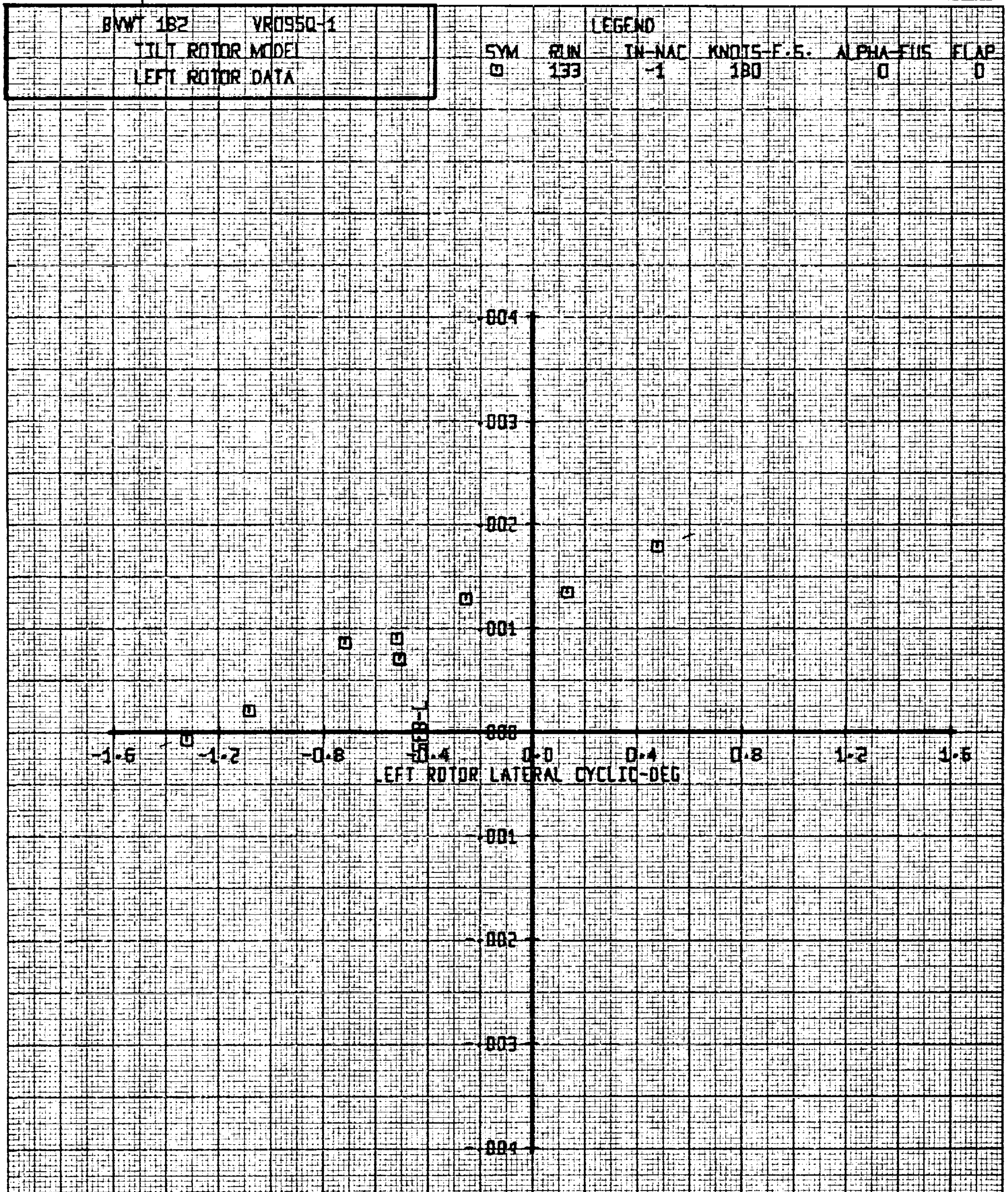


Figure 14-076. Left Rotor Side Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

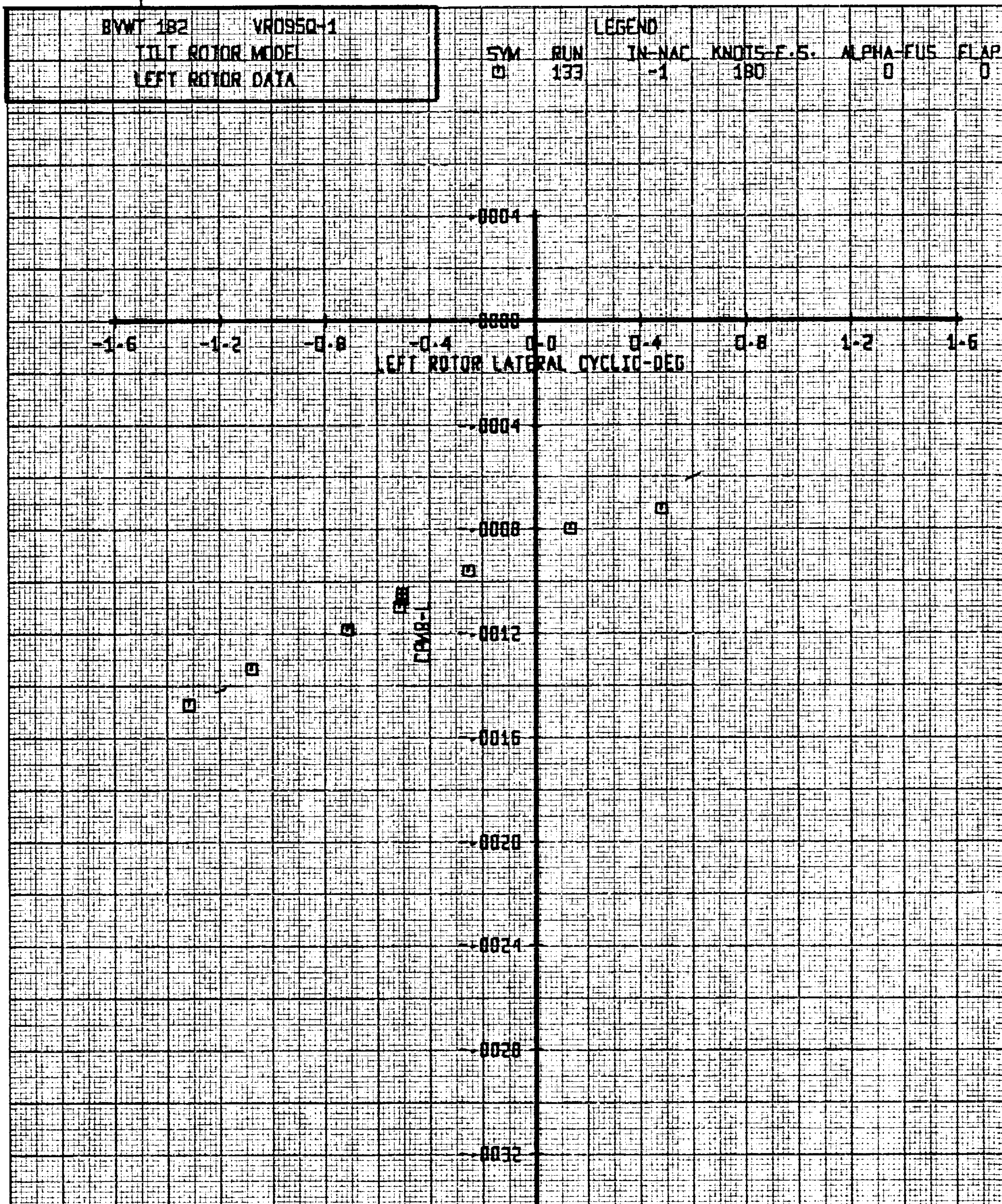
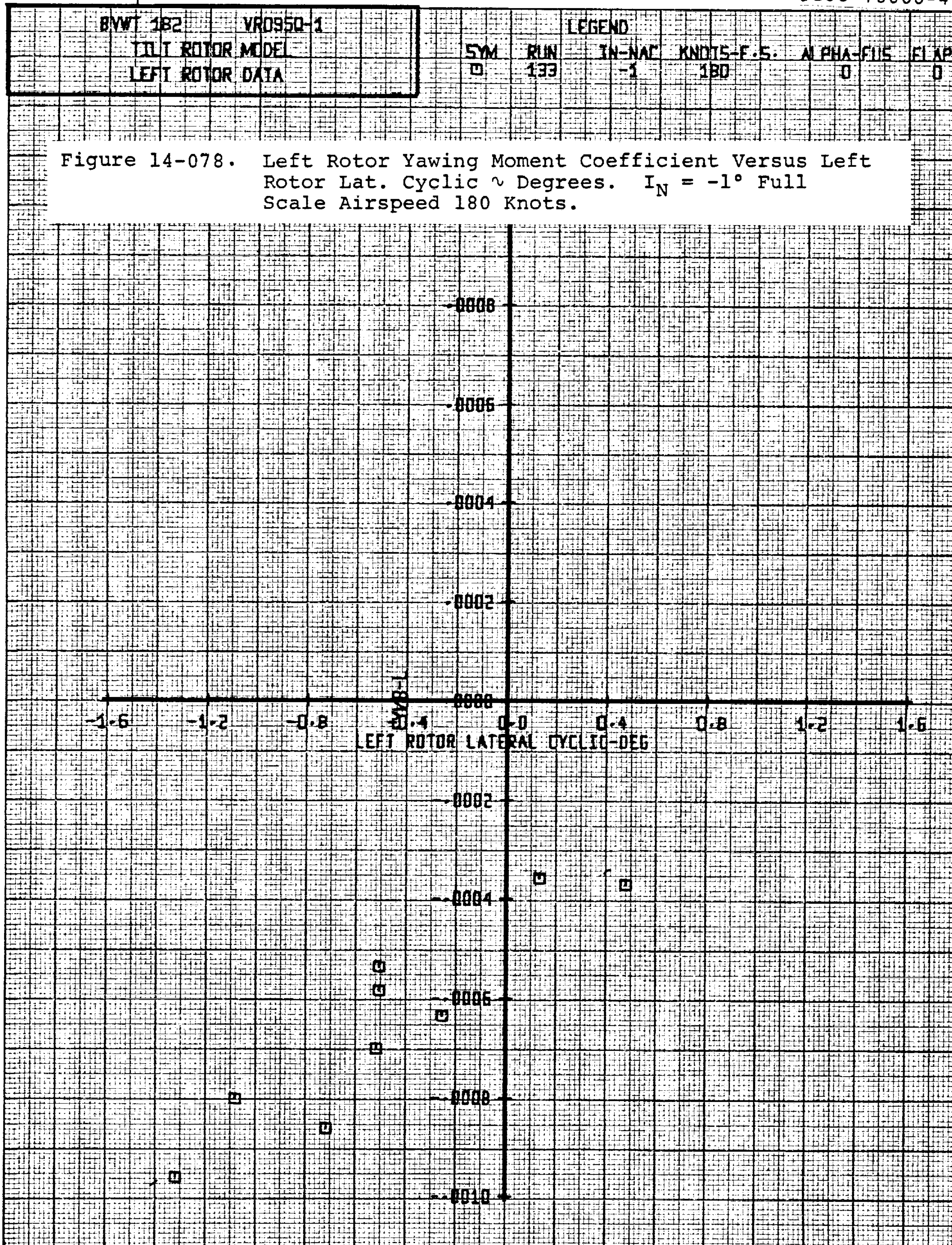


Figure 14-077. Left Rotor Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

Figure 14-078. Left Rotor Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.



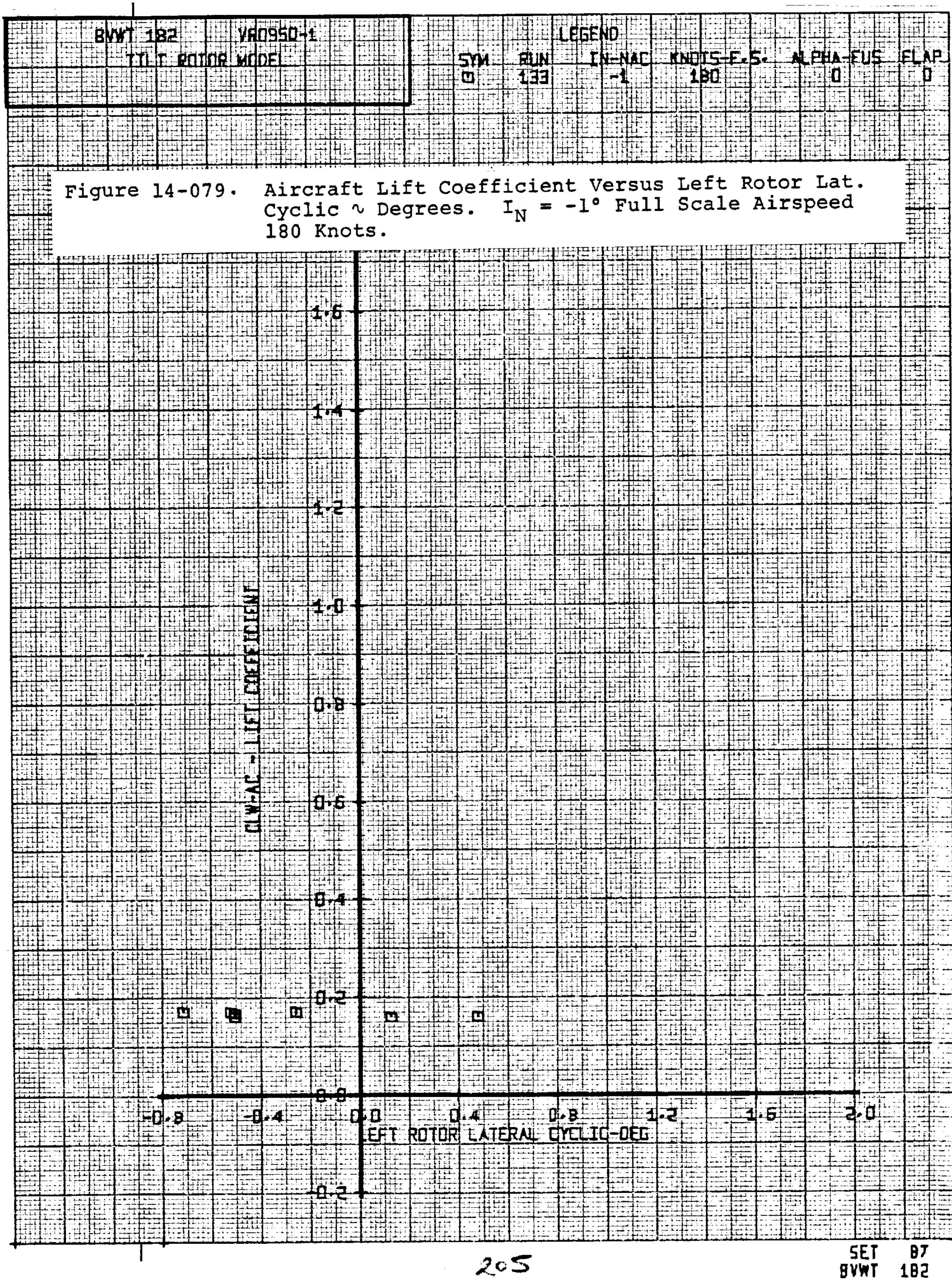


Figure 14-079. Aircraft Lift Coefficient Versus Left Rotor Lat. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

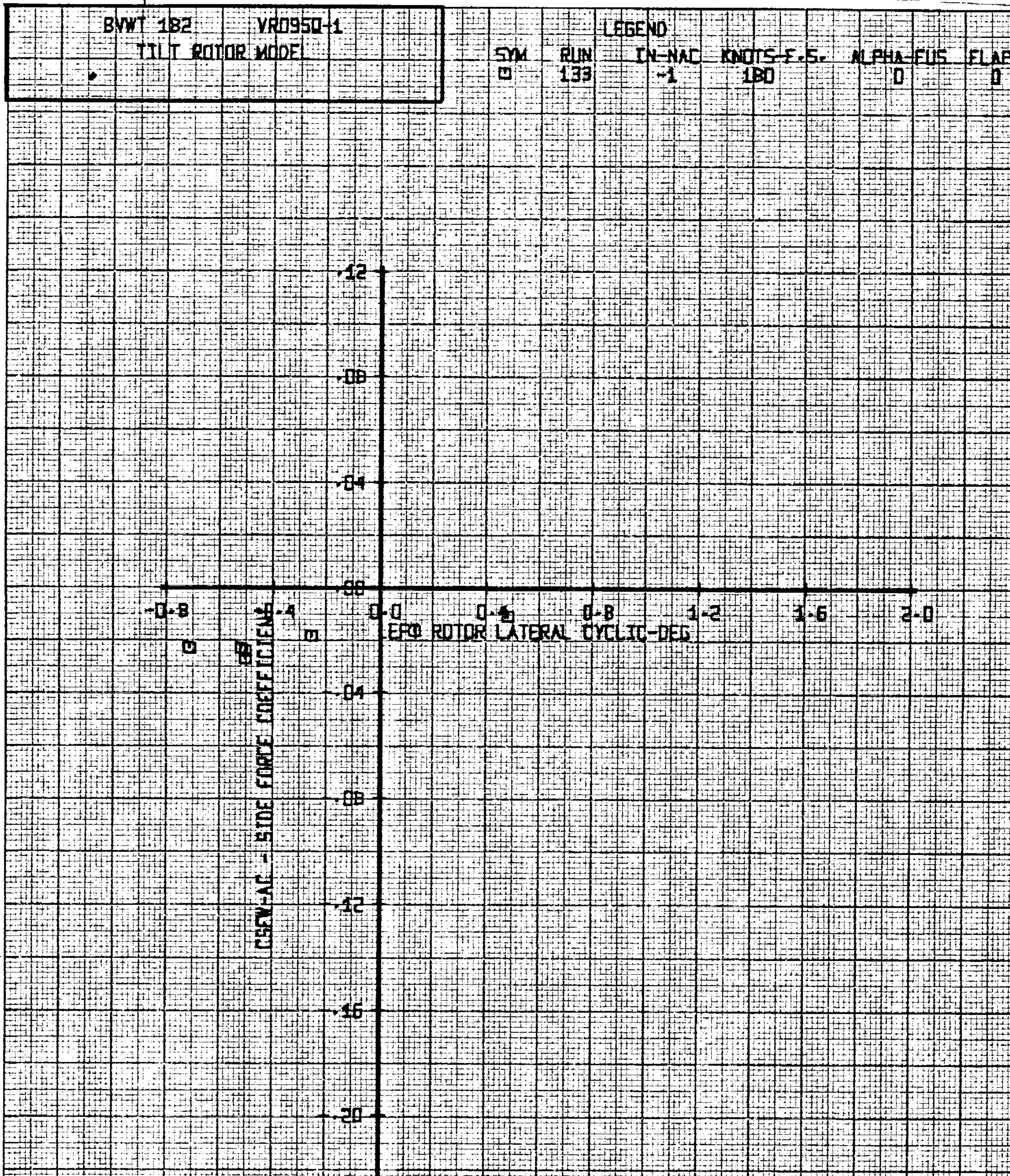


Figure 14-080. Aircraft Side Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

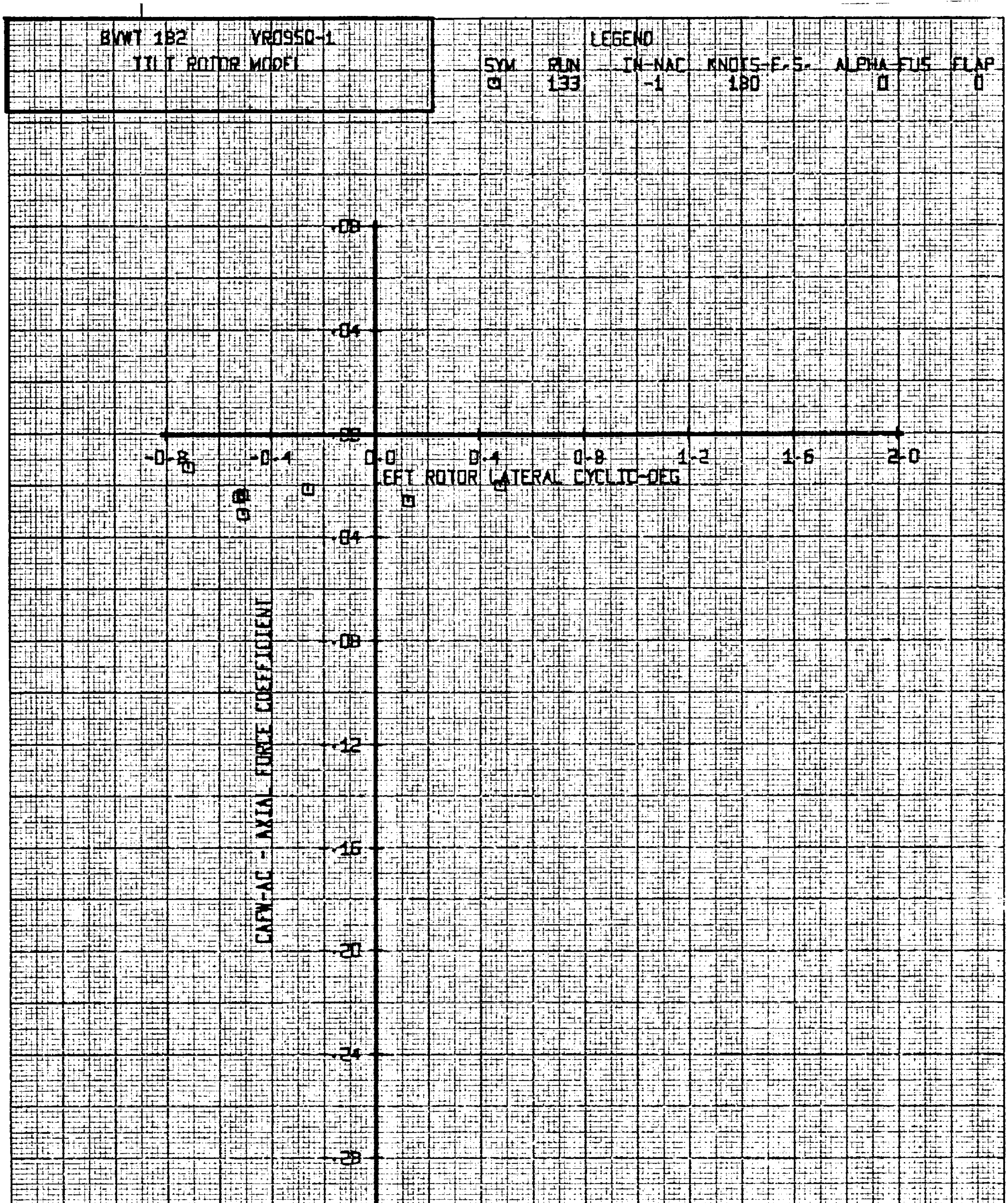


Figure 14-081. Aircraft Axial Force Coefficient Versus Left Rotor Lat. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

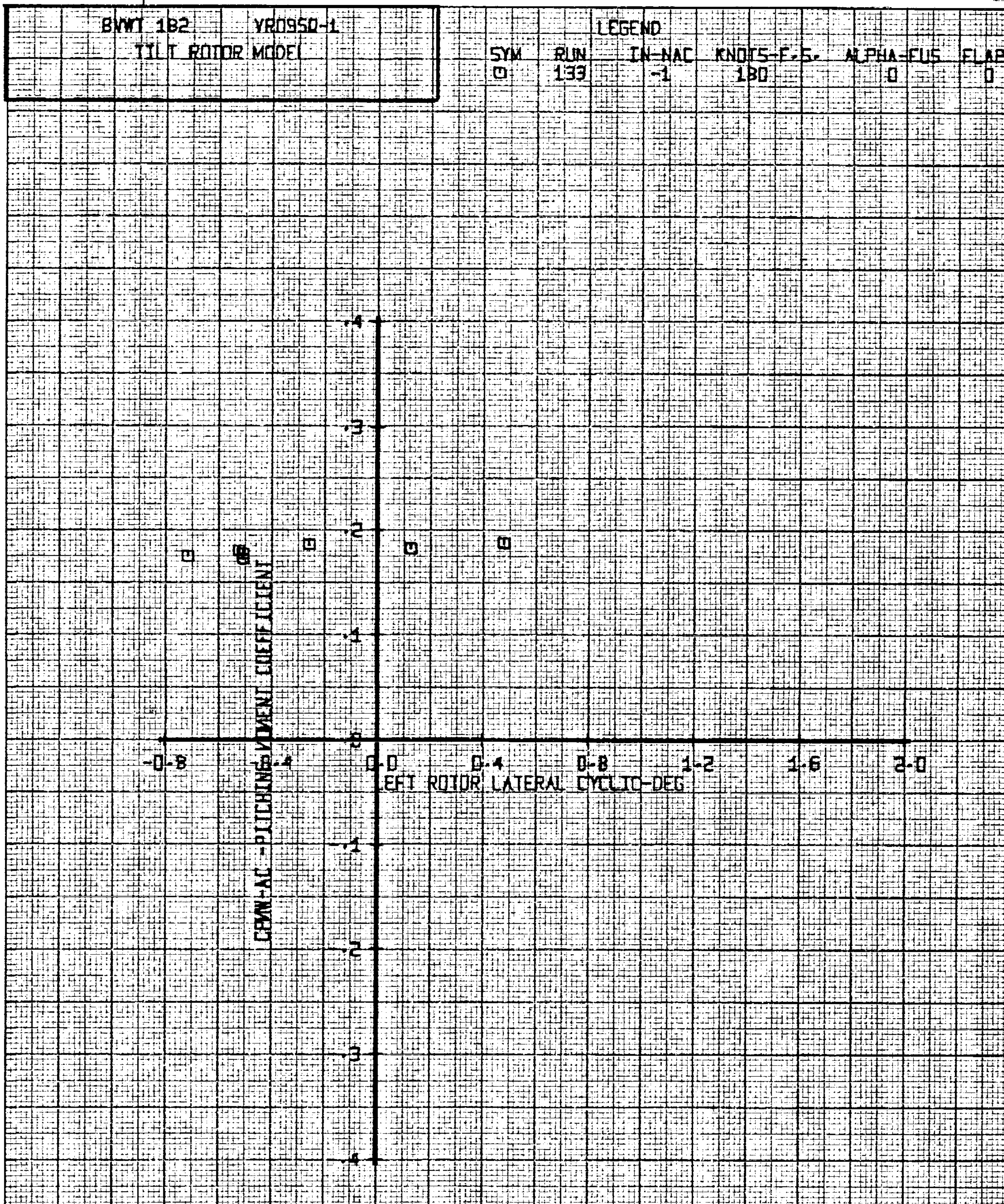


Figure 14-082. Aircraft Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.

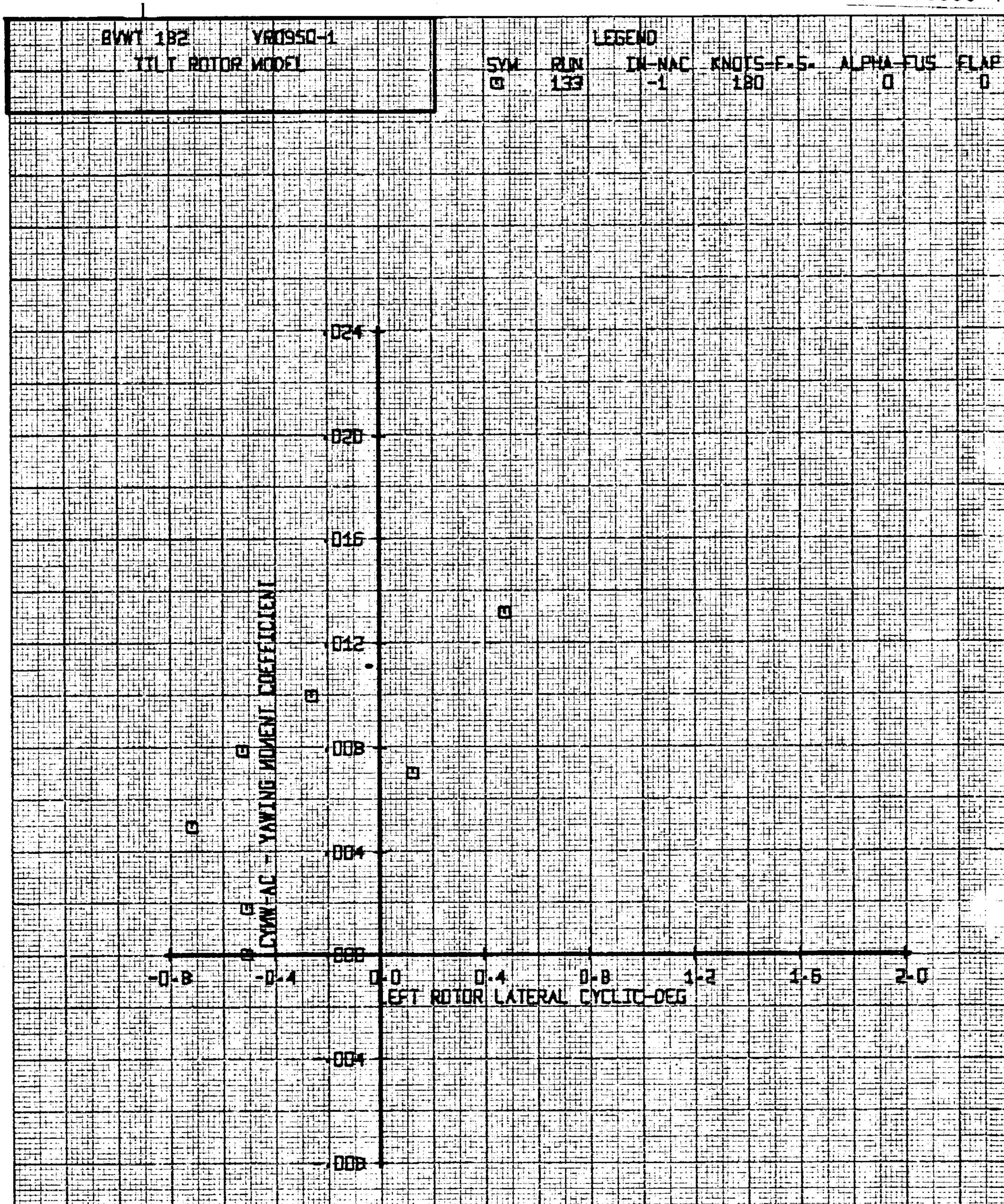


Figure 14-083. Aircraft Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 180 Knots.

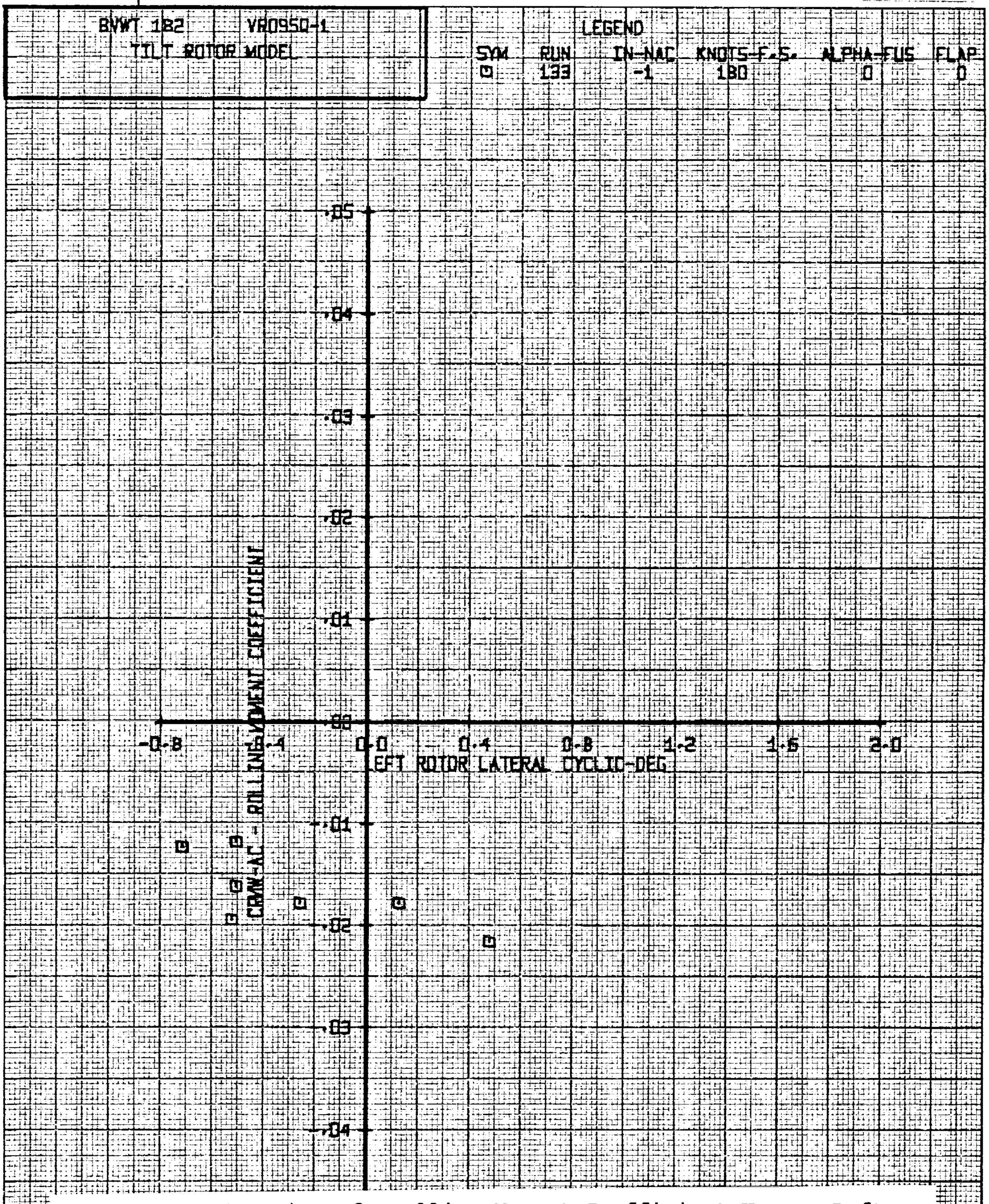


Figure 14-084. Aircraft Rolling Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.

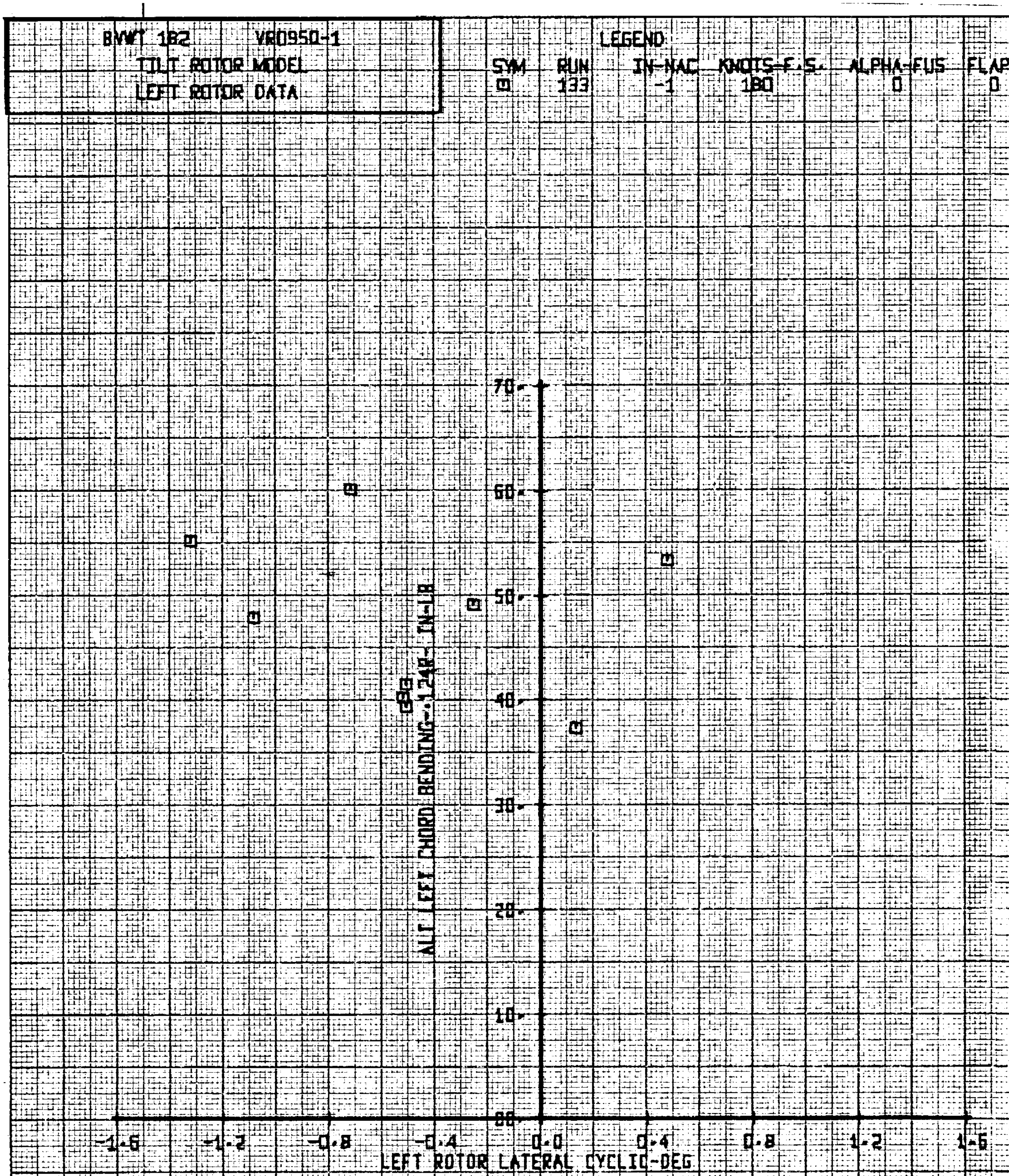


Figure 14-085. Alt. Left Chord Bending Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.

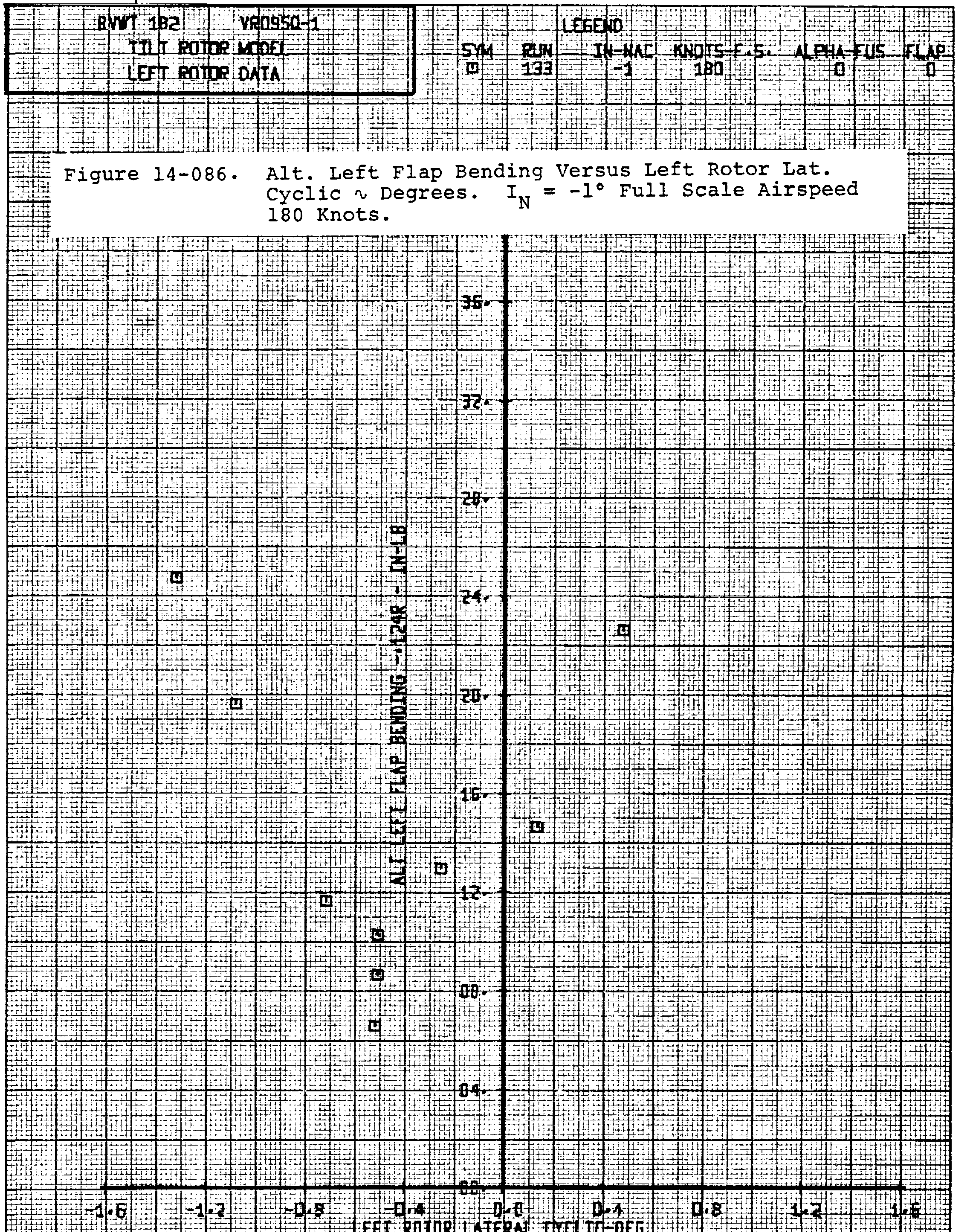


Figure 14-086. Alt. Left Flap Bending Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.

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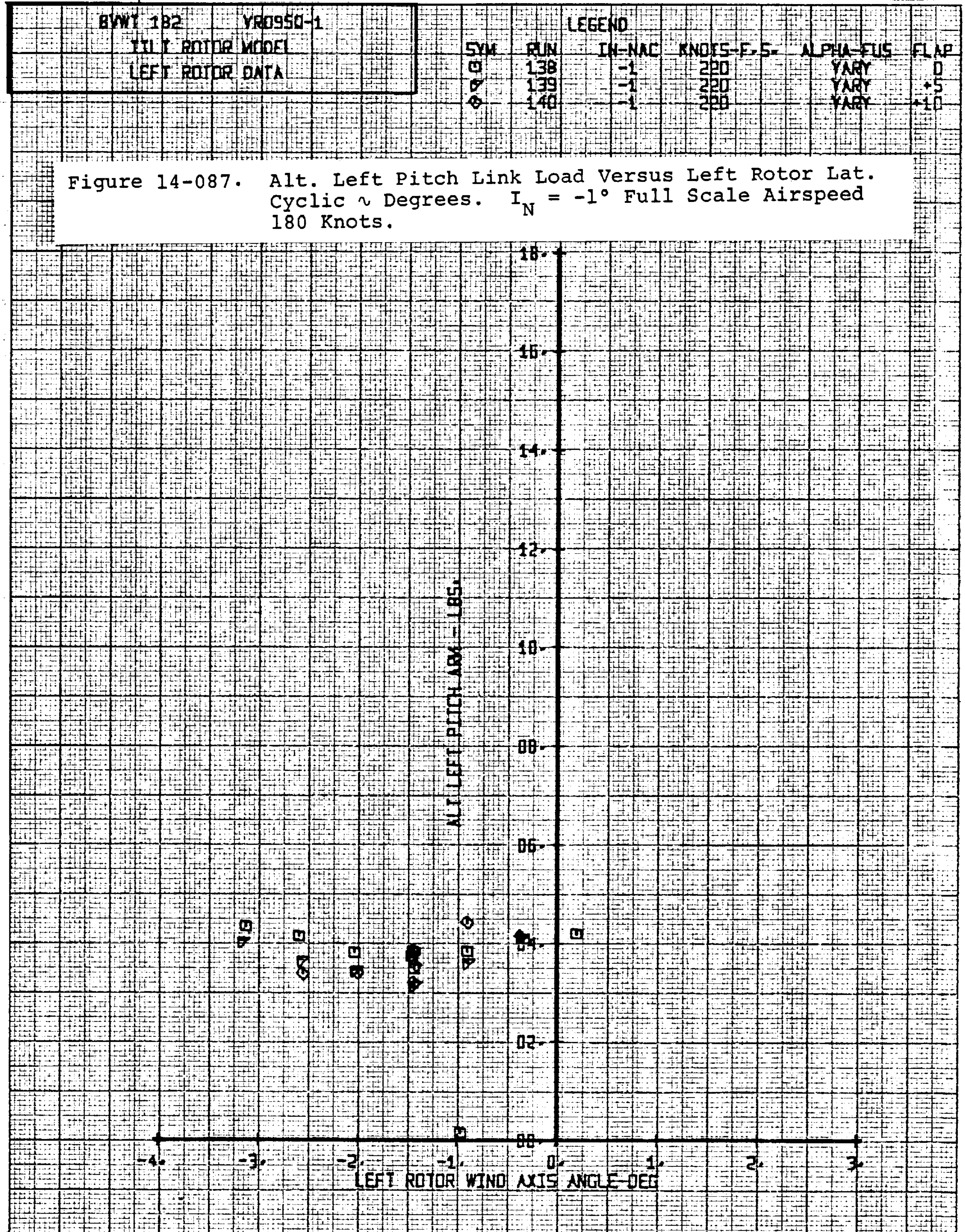
Figure 14-087. Alt. Left Pitch Link Load Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 180 Knots.



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BVWT 182

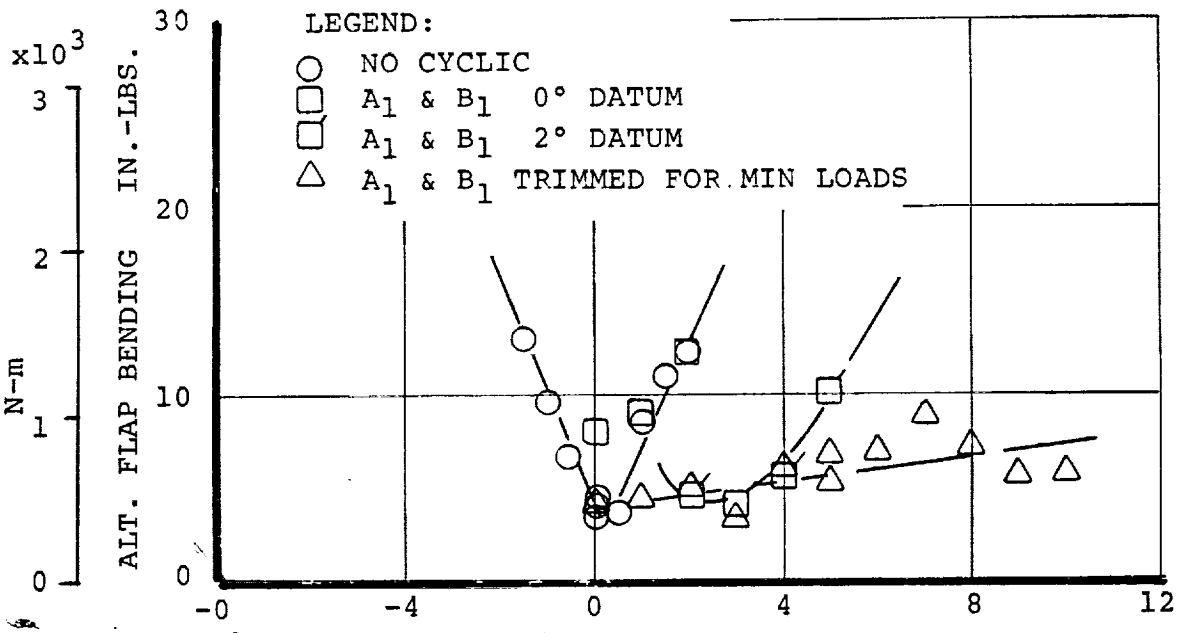

Figure 14-089. Alt. Left Rotor Blade Flap Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. I_N = -1° Full Scale Airspeed 180 Knots.

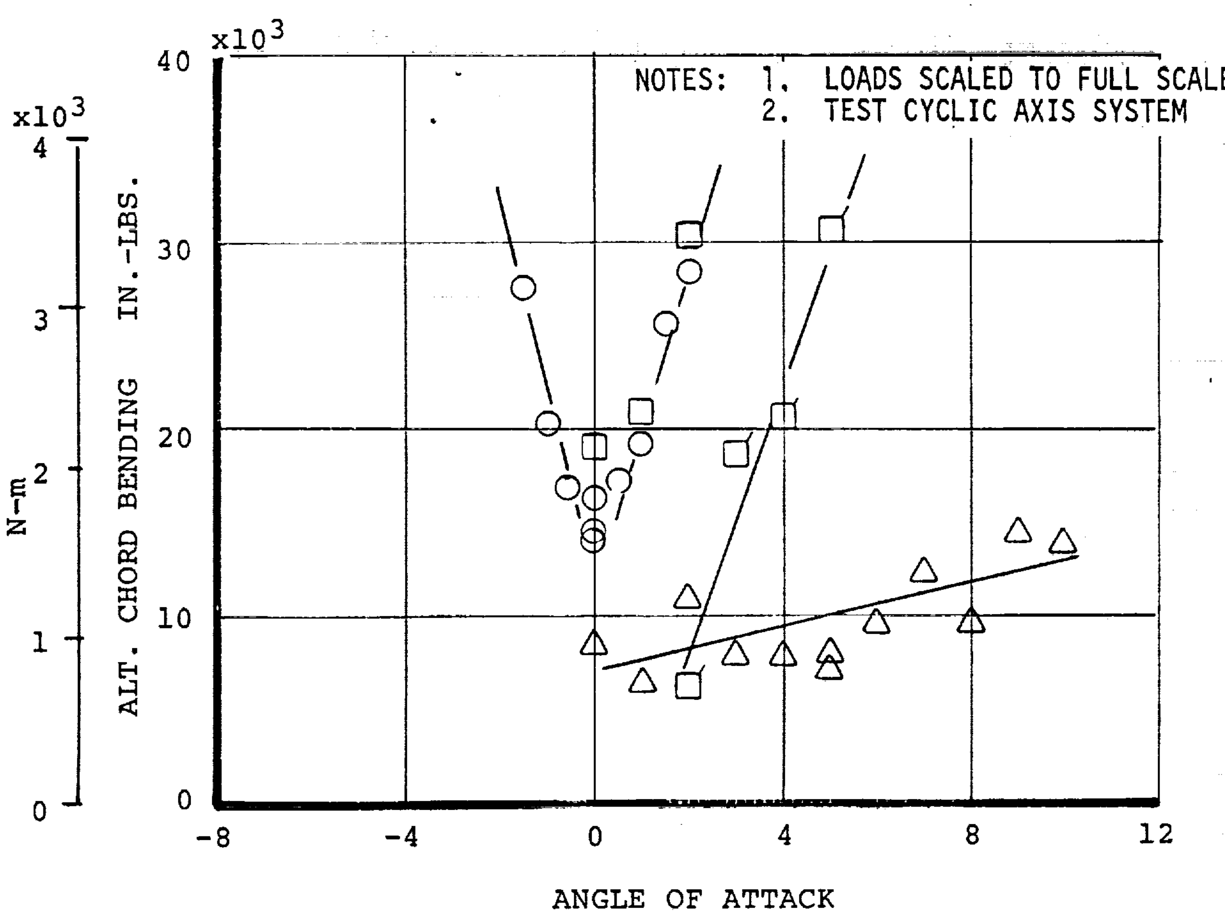

Figure 14-088. Alt. Left Rotor Blade Chord Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. I_N = -1° Full Scale Airspeed 180 Knots.

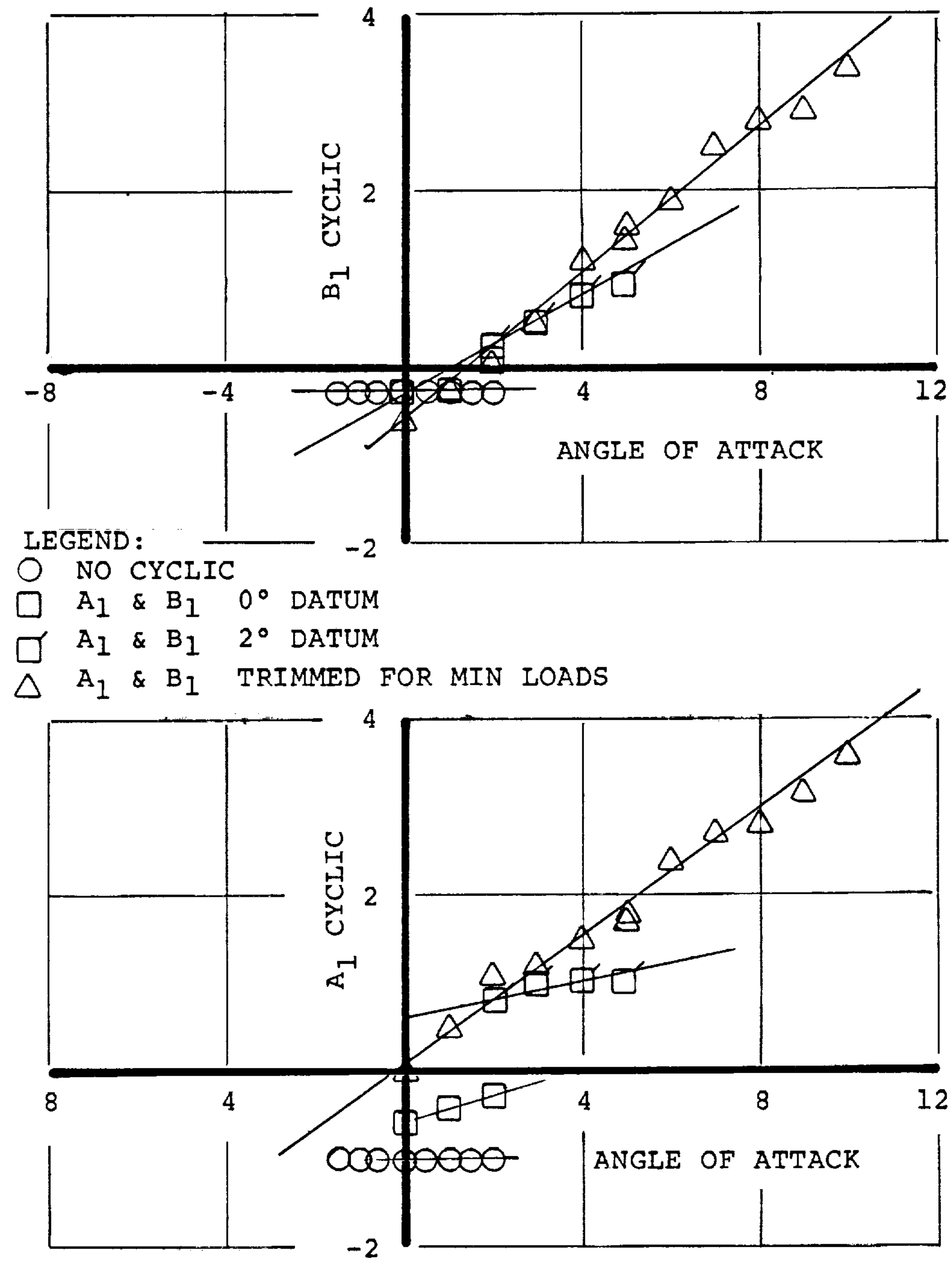

Figure 14-090. Left Rotor Cyclic Schedules. $I_N = -1°$ Full Scale Airspeed 180 Knots.

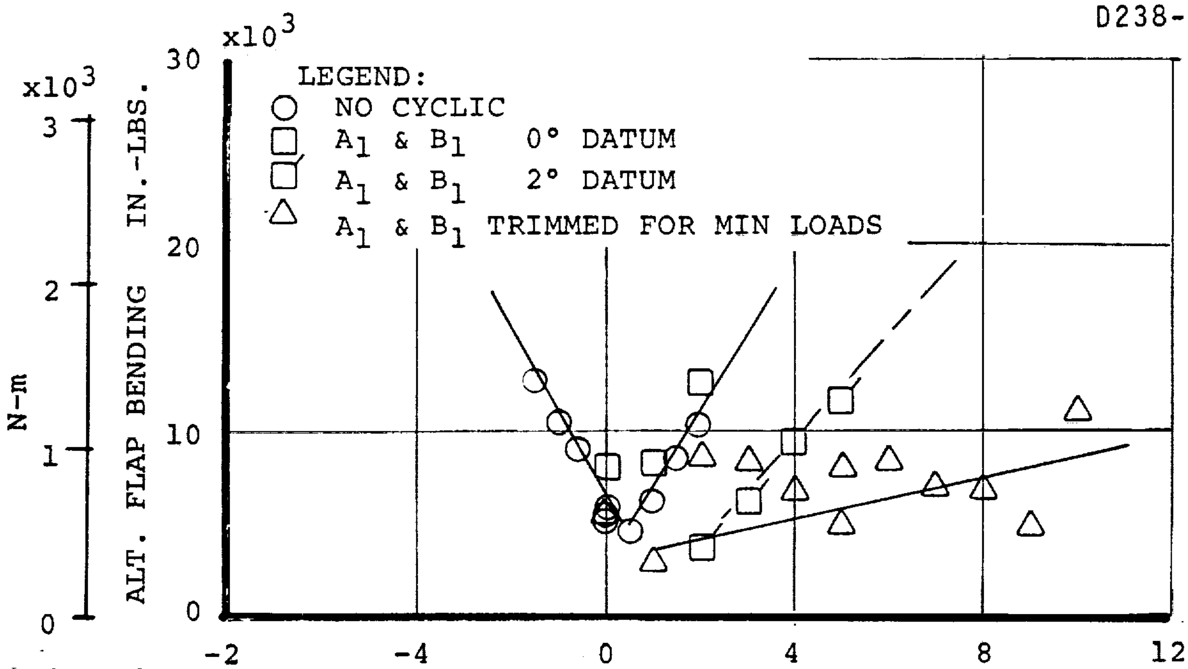

Figure 14-092. Alt. Right Rotor Blade Flap Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. I_N = -1° Full Scale Airspeed 180 Knots.

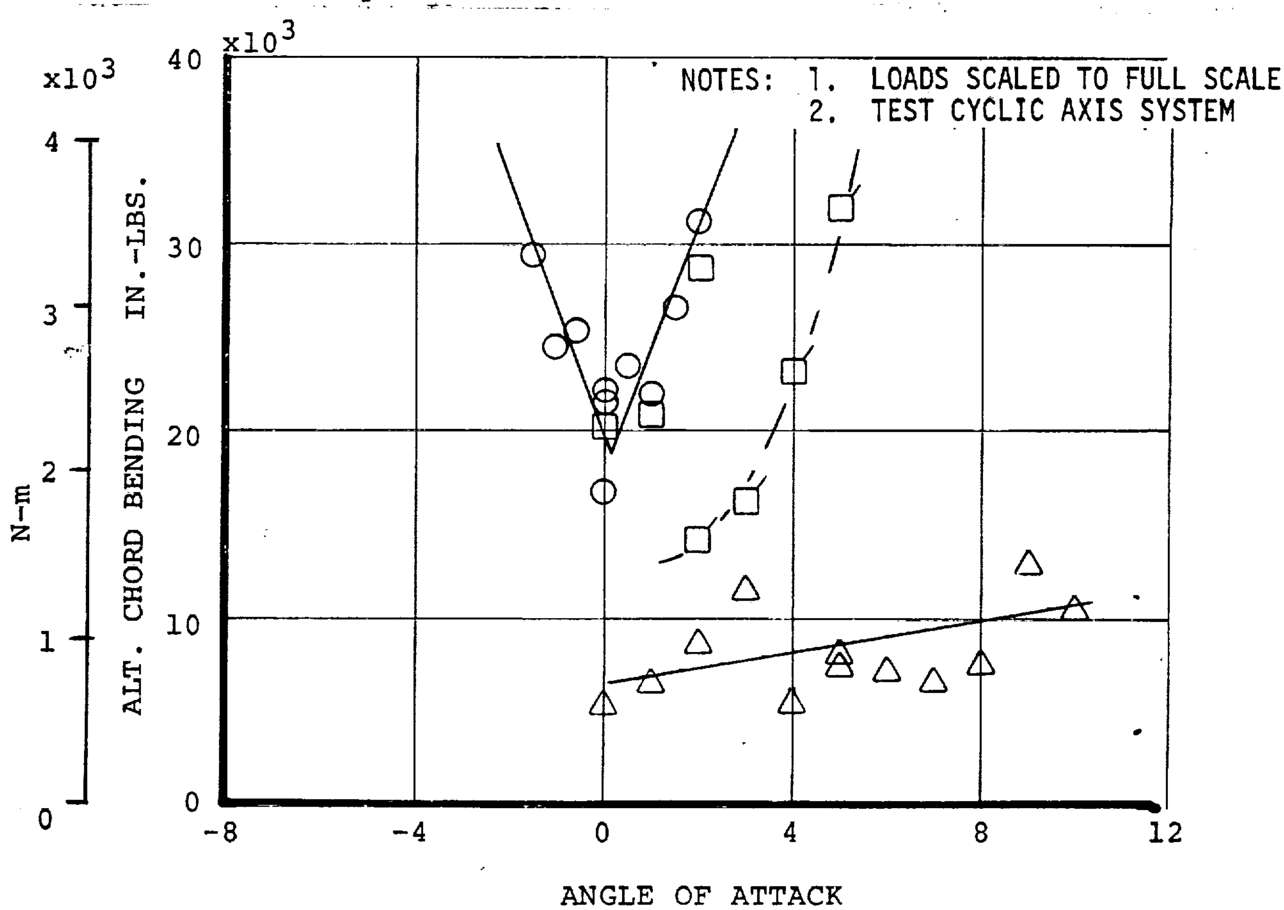

Figure 14-091. Alt. Right Rotor Blade Chord Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. I_N = -1° Full Scale Airspeed 180 Knots.

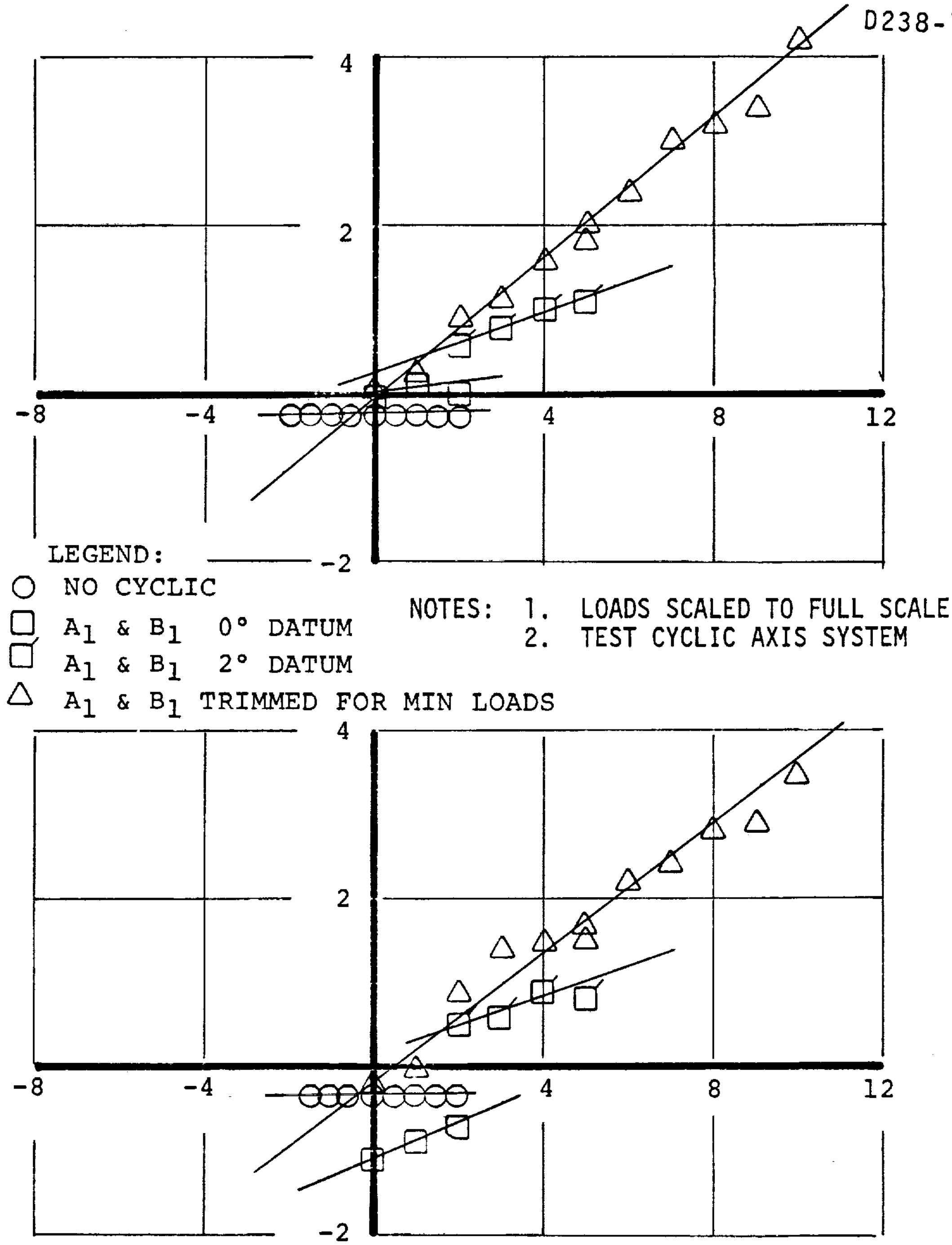

Figure 14-093. Right Rotor Cyclic Schedules. I_N = -1° Full Scale Airspeed 180 Knots.

$I_N = -1^\circ$ $V_{FS} = 220$ KTS.

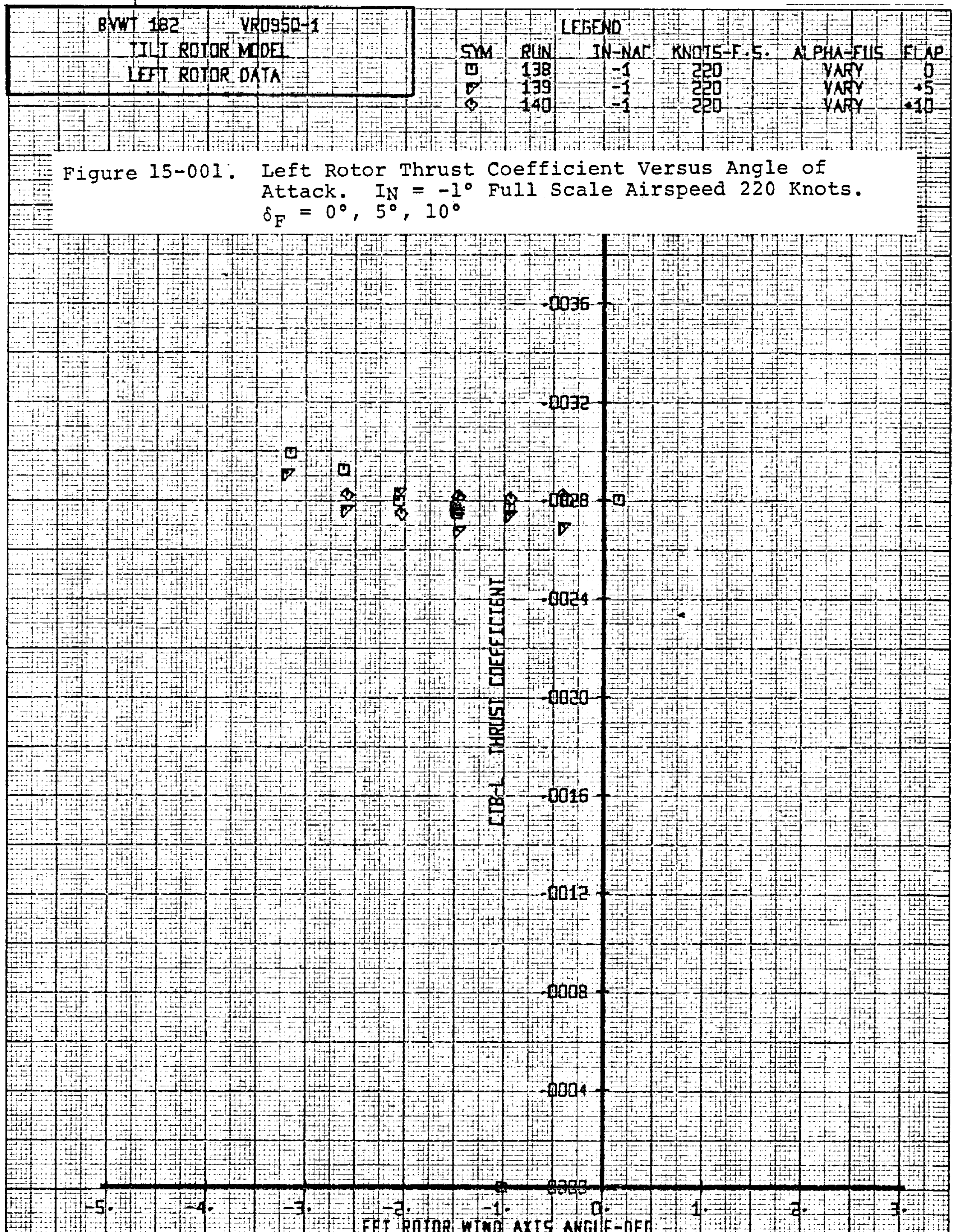

Figure 15-001. Left Rotor Thrust Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$

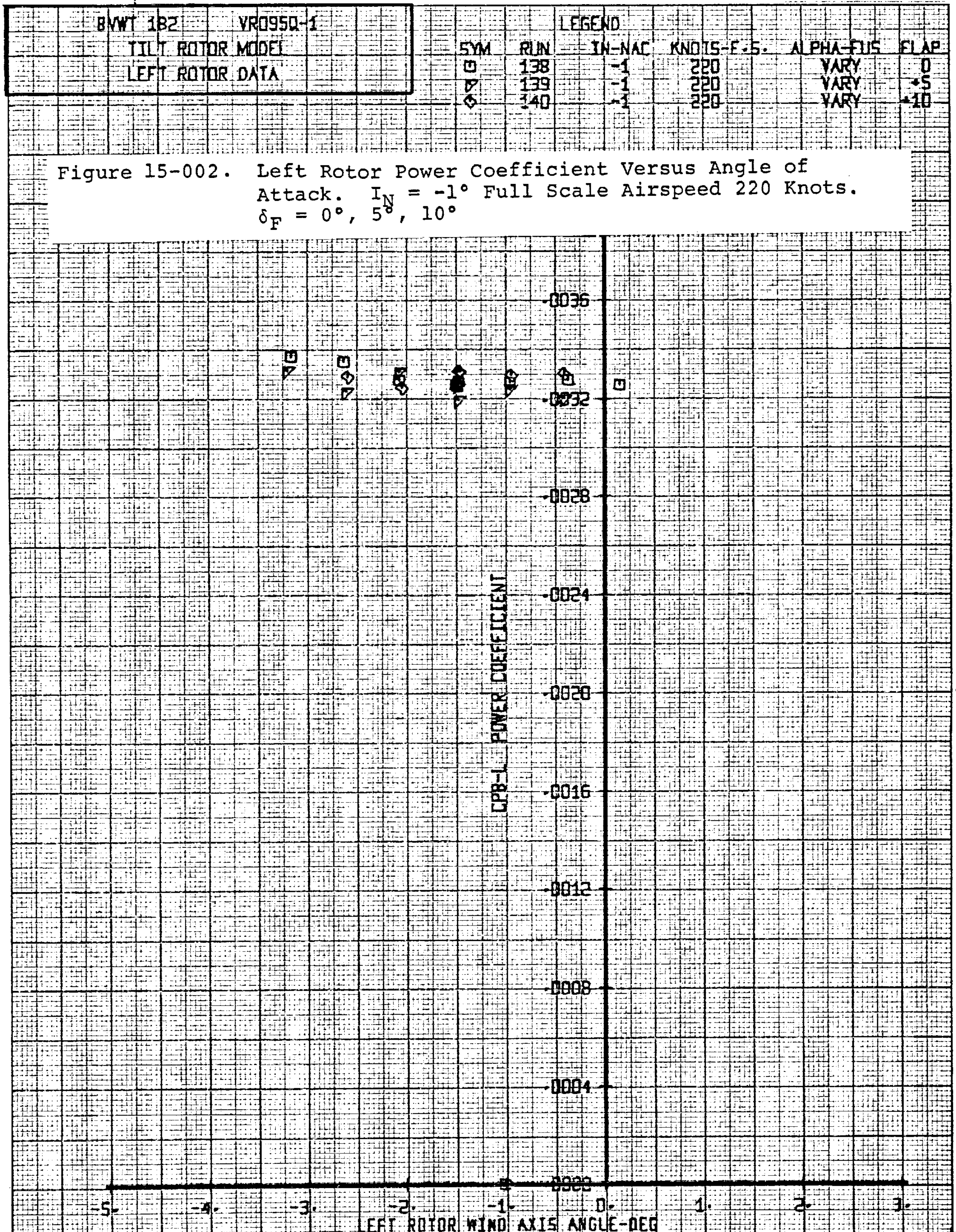

Figure 15-002. Left Rotor Power Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$

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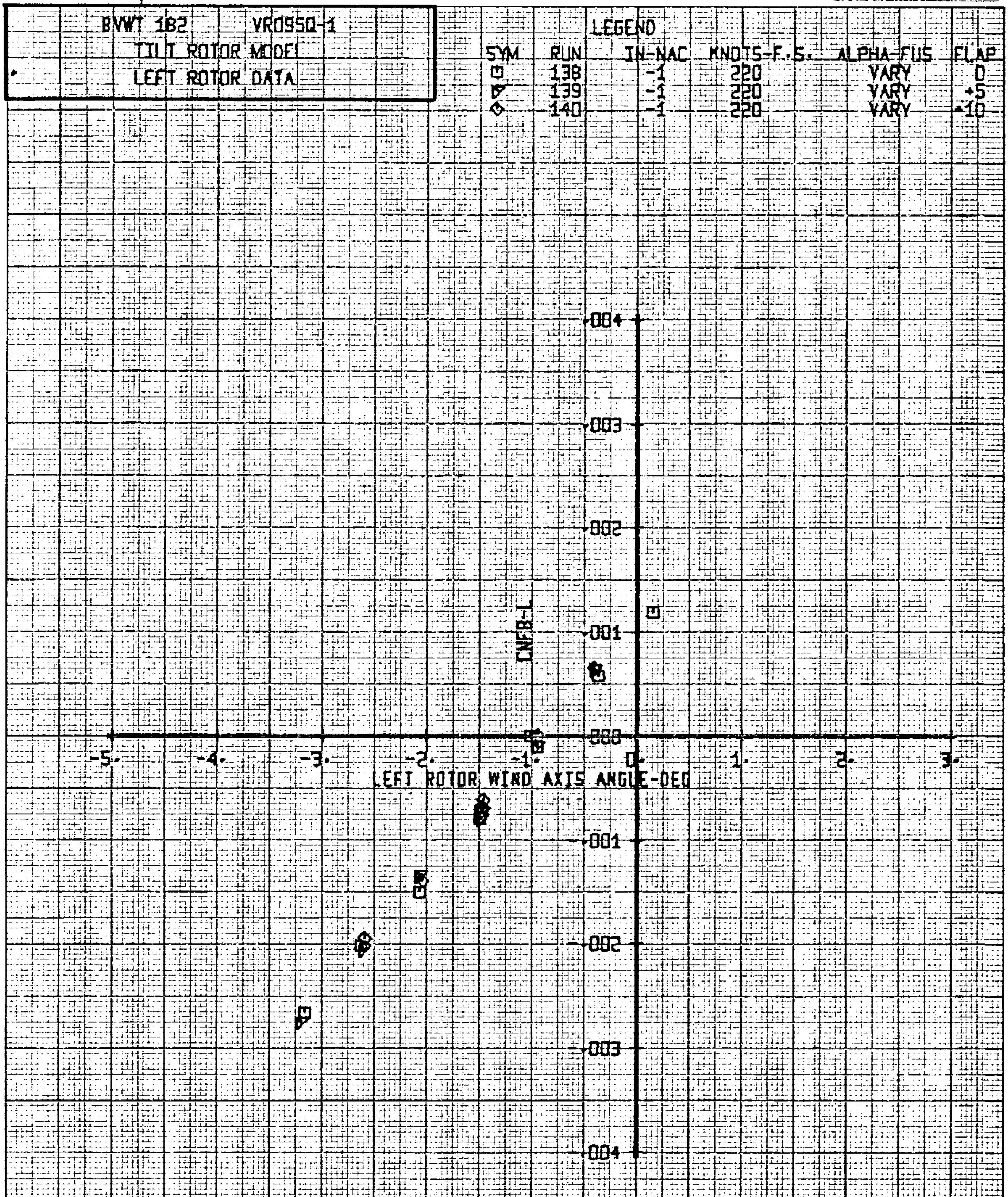


Figure 15-003. Left Rotor Normal Force Coefficient Versus Angle of Attack. $I_N = 1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$

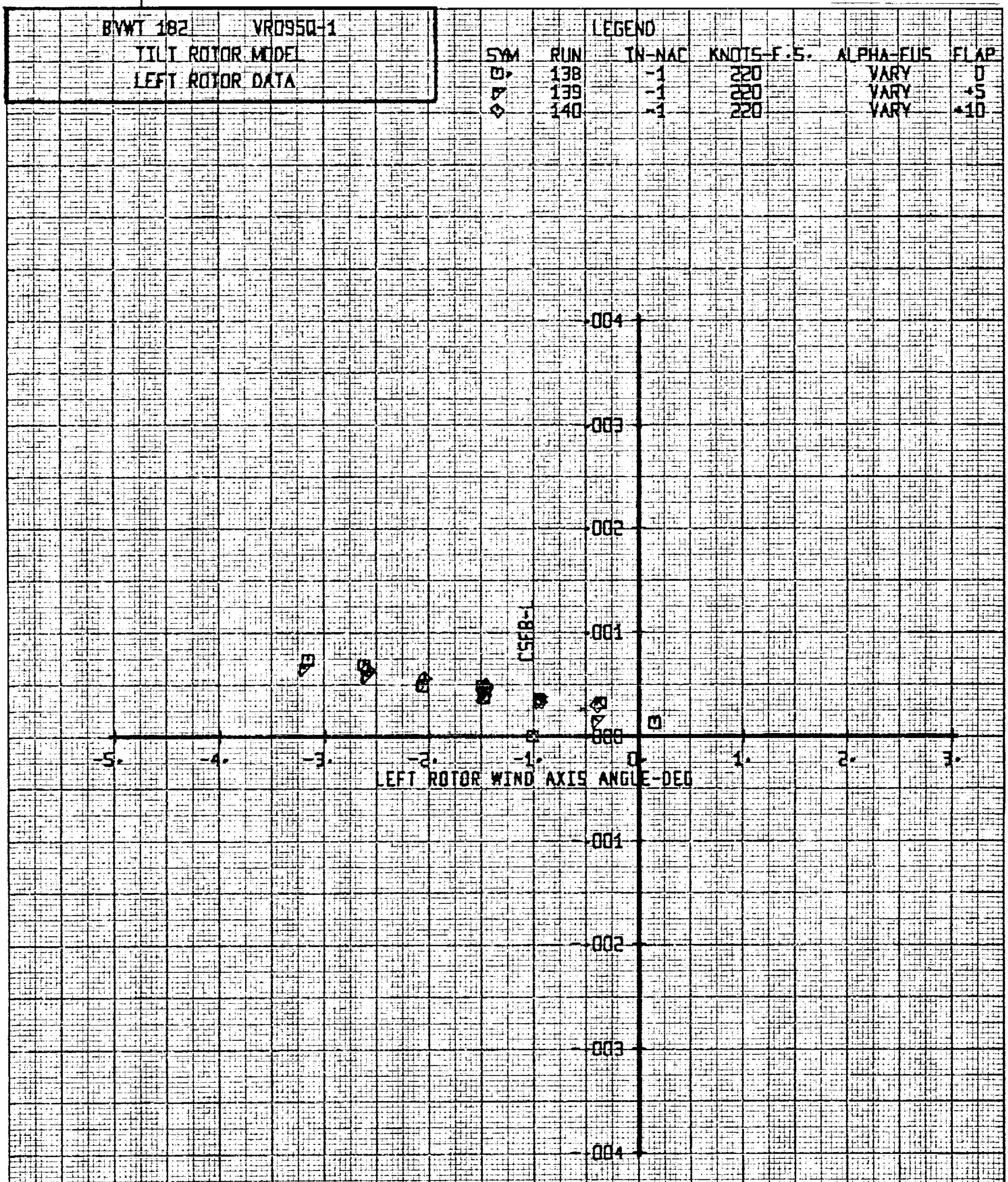


Figure 15-004. Left Rotor Side Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$

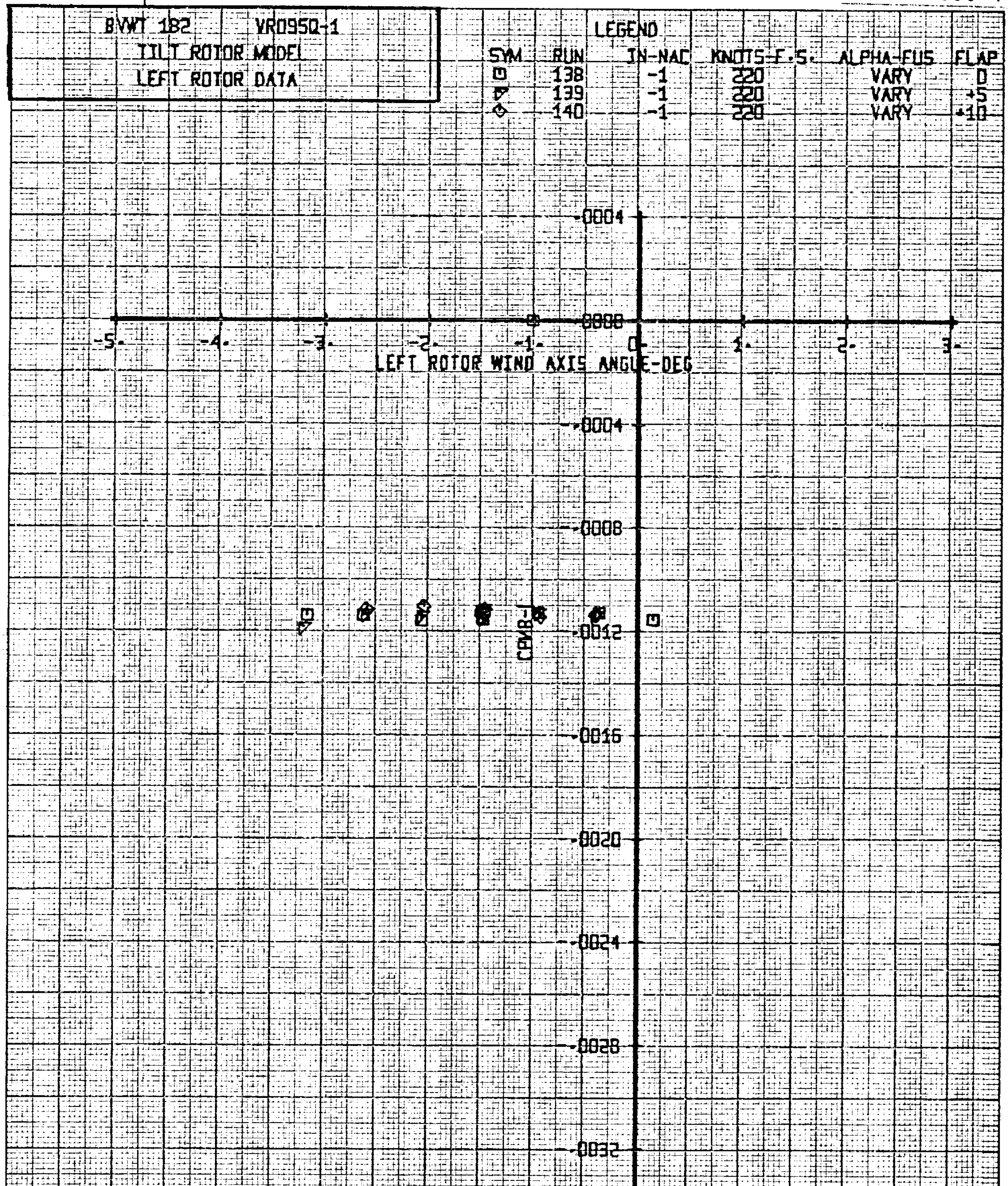


Figure 15-005. Left Rotor Pitching Moment Versus Angle of Attack.
I_N = -1° Full Scale Airspeed 220 Knots.
δ_F = 0°, 5°, 10°

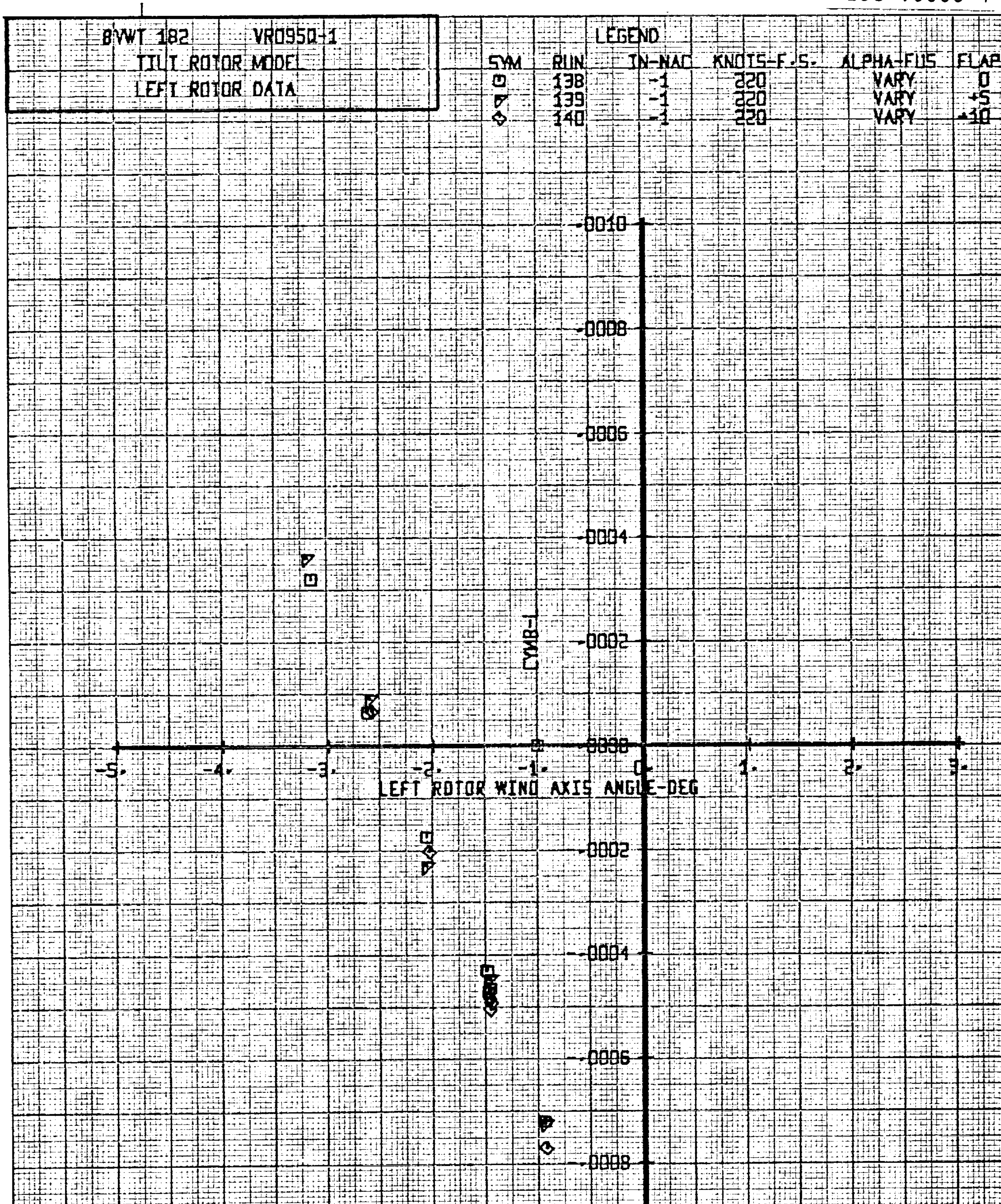


Figure 15-006. Left Rotor Yawing Moment Versus Angle of Attack.
$I_N = -1°$ Full Scale Airspeed 220 Knots.
$\delta_F = 0°, 5°, 10°$

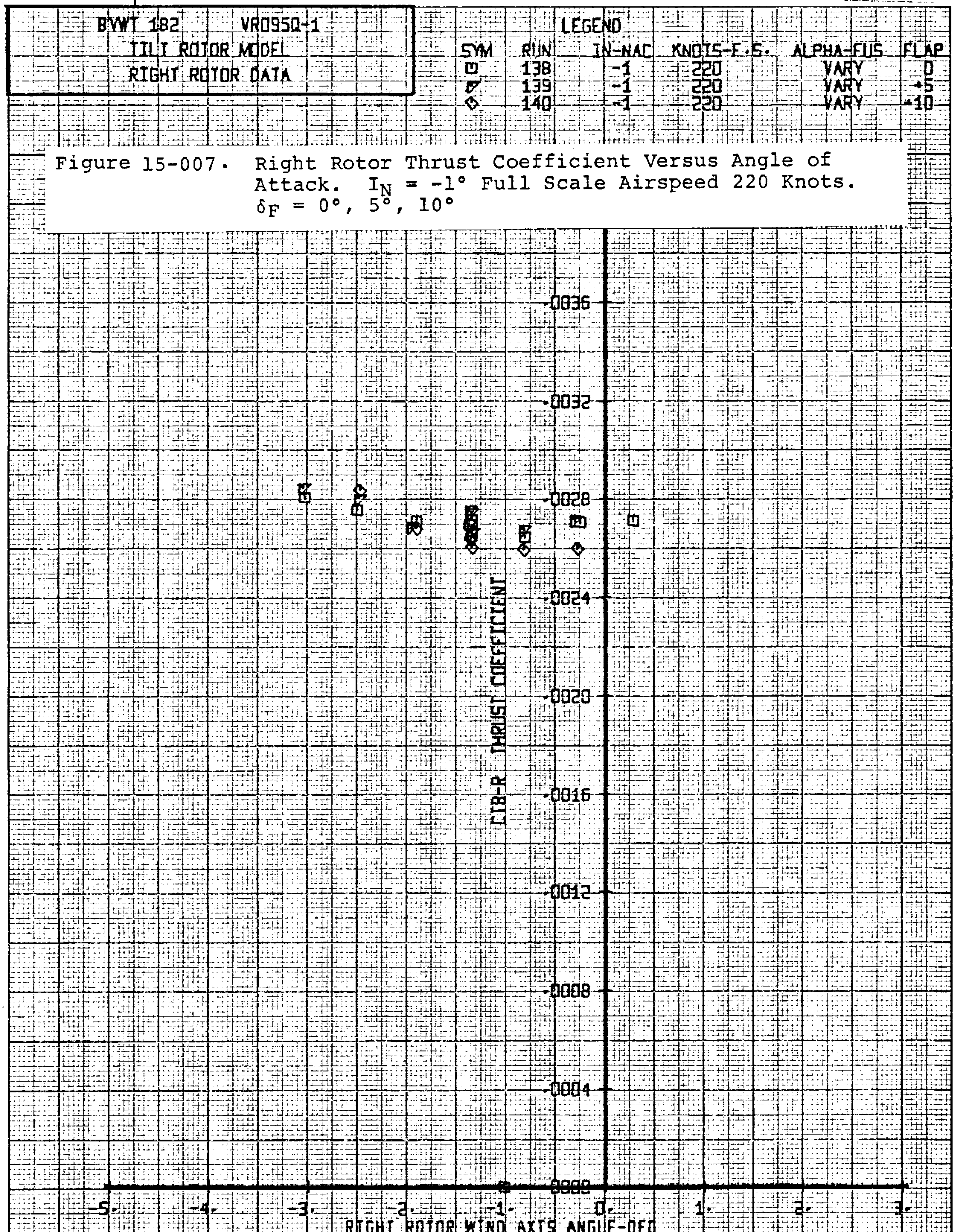
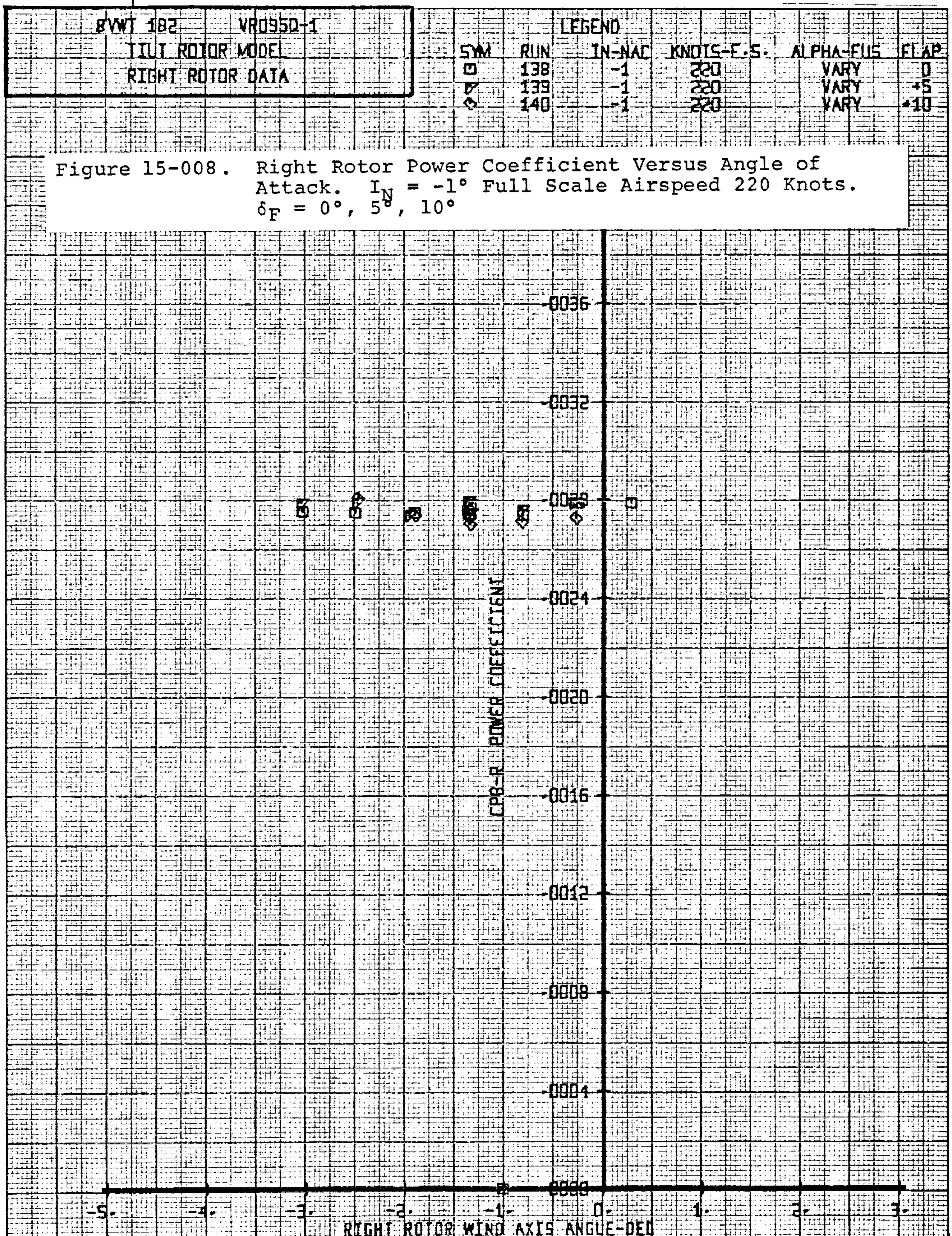


Figure 15-007. Right Rotor Thrust Coefficient Versus Angle of Attack. I_N = -1° Full Scale Airspeed 220 Knots. δ_F = 0°, 5°, 10°

Figure 15-008. Right Rotor Power Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$



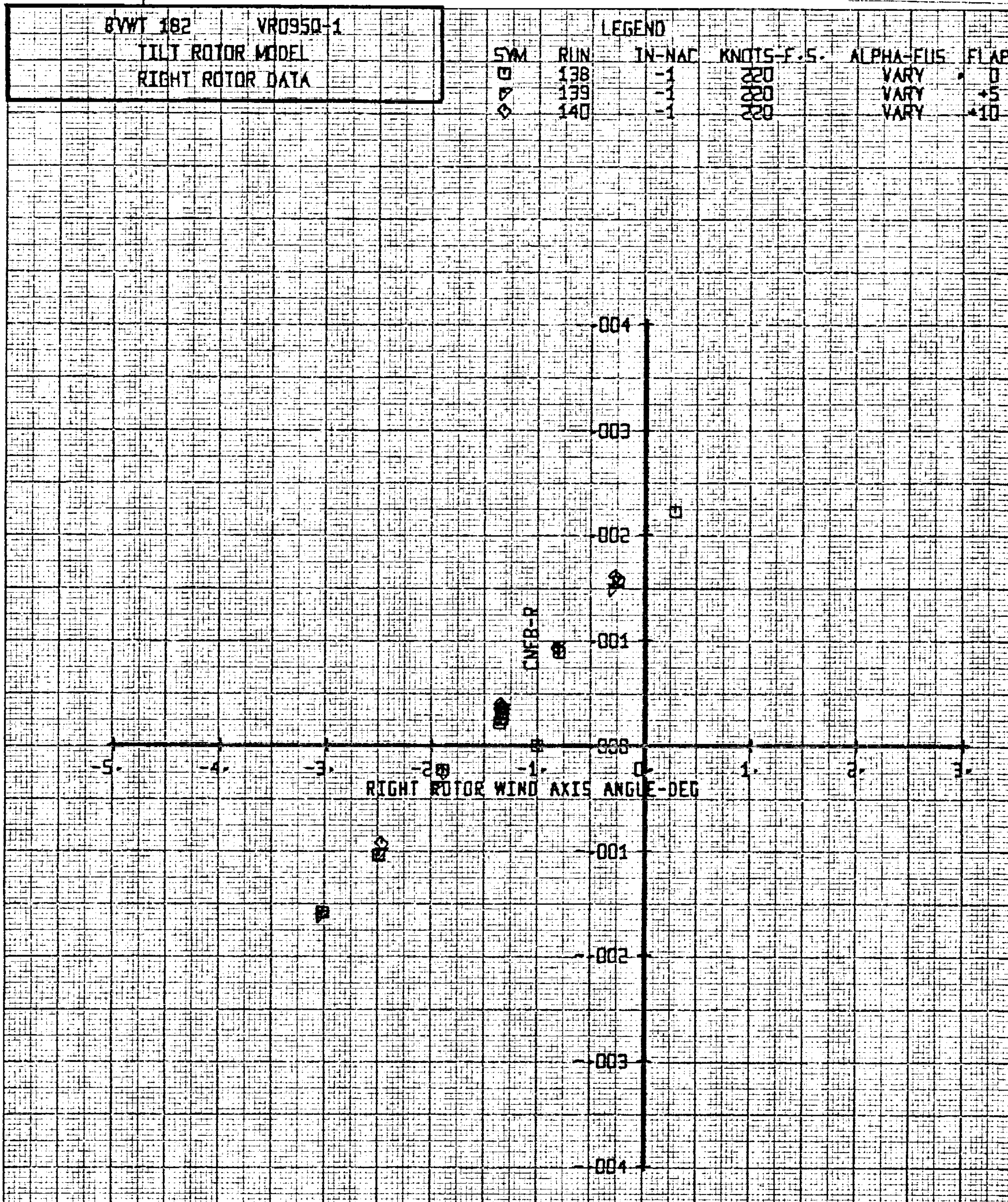


Figure 15-009. Right Rotor Normal Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$

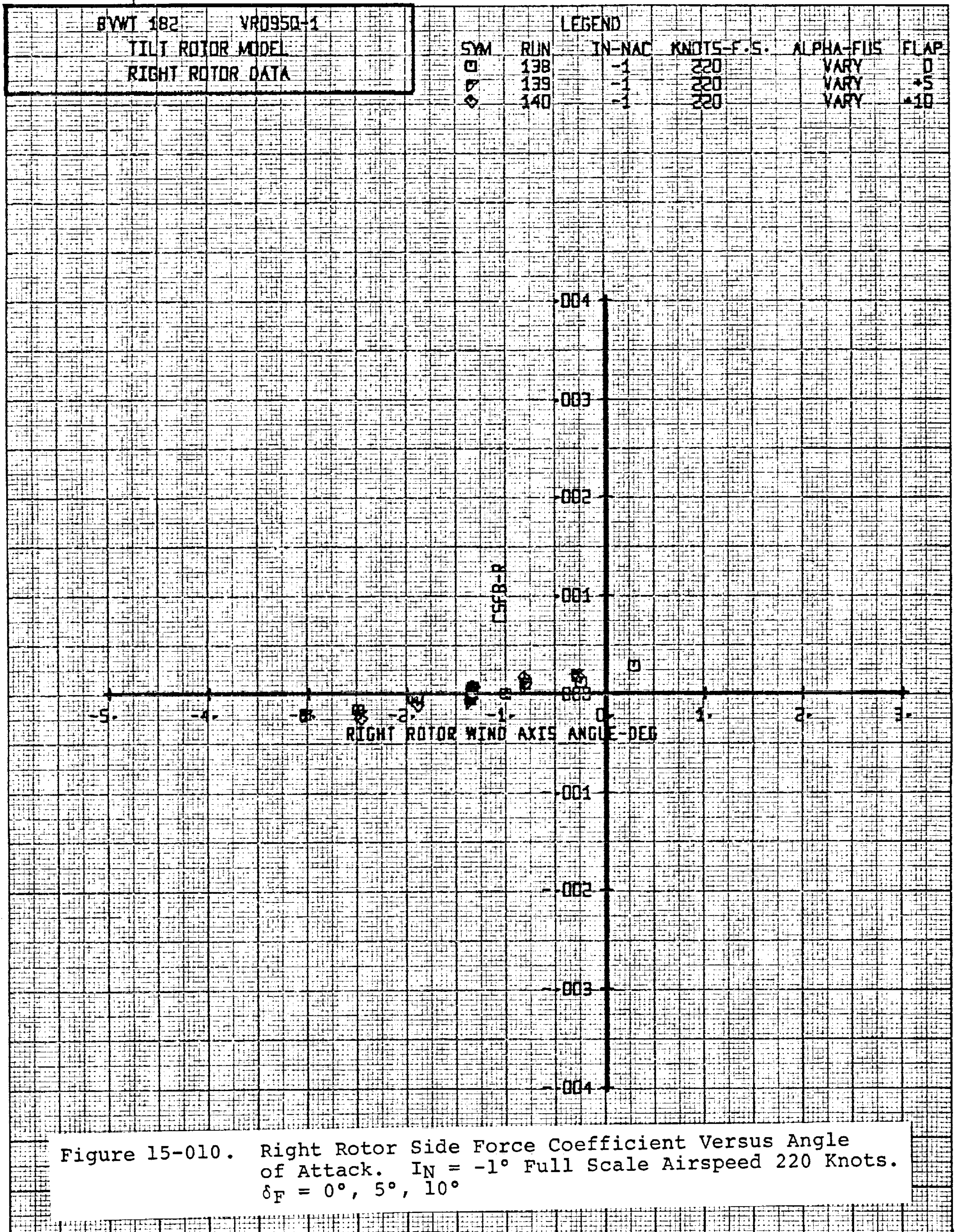


Figure 15-010. Right Rotor Side Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$

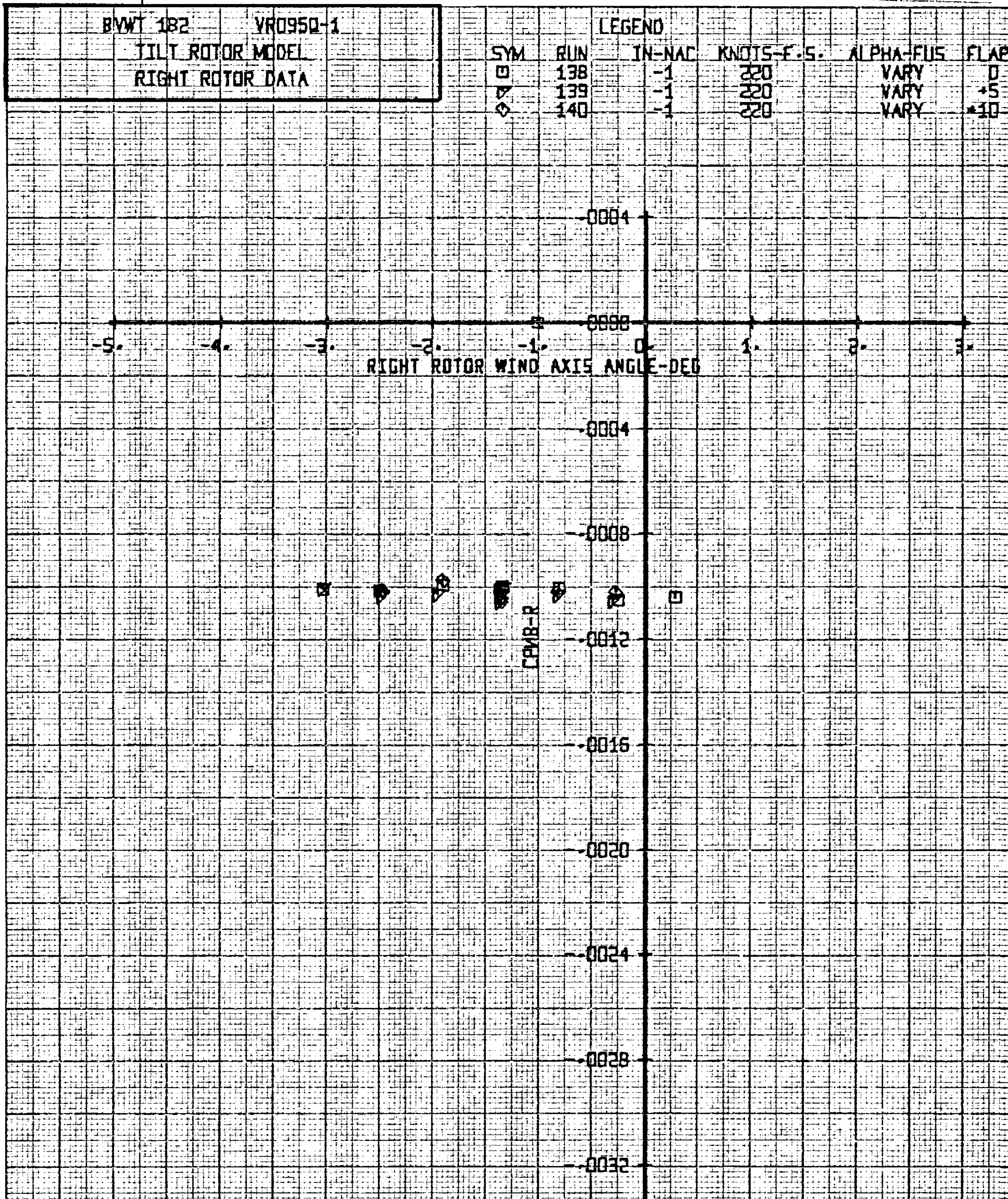


Figure 15-011. Right Rotor Pitching Moment Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$

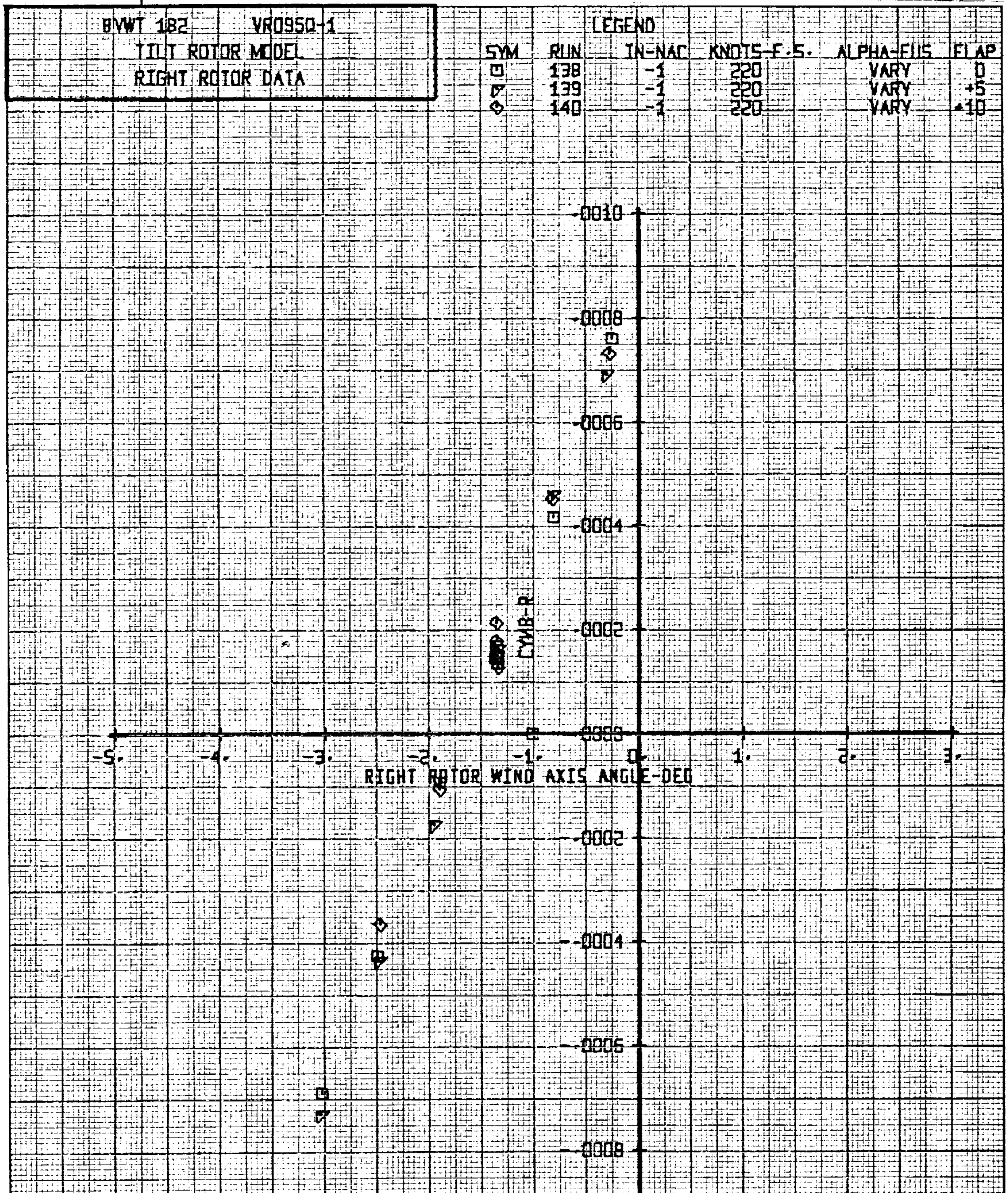


Figure 15-012. Right Rotor Yawing Moment Versus Angle of Attack.
$I_N = -1°$ Full Scale Airspeed 220 Knots.
$\delta_F = 0°, 5°, 10°$

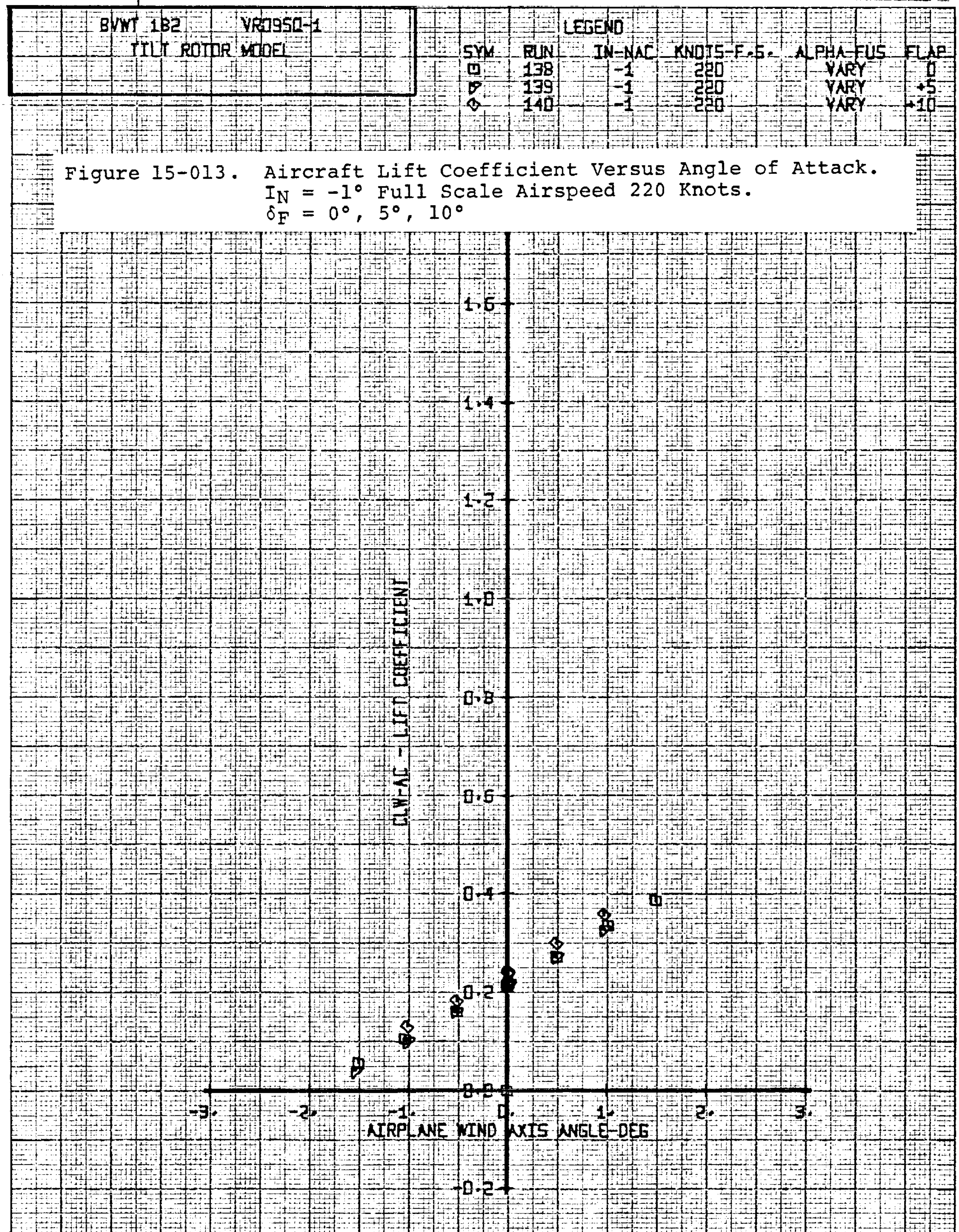


Figure 15-013. Aircraft Lift Coefficient Versus Angle of Attack.
$I_N = -1°$ Full Scale Airspeed 220 Knots.
$\delta_F = 0°, 5°, 10°$

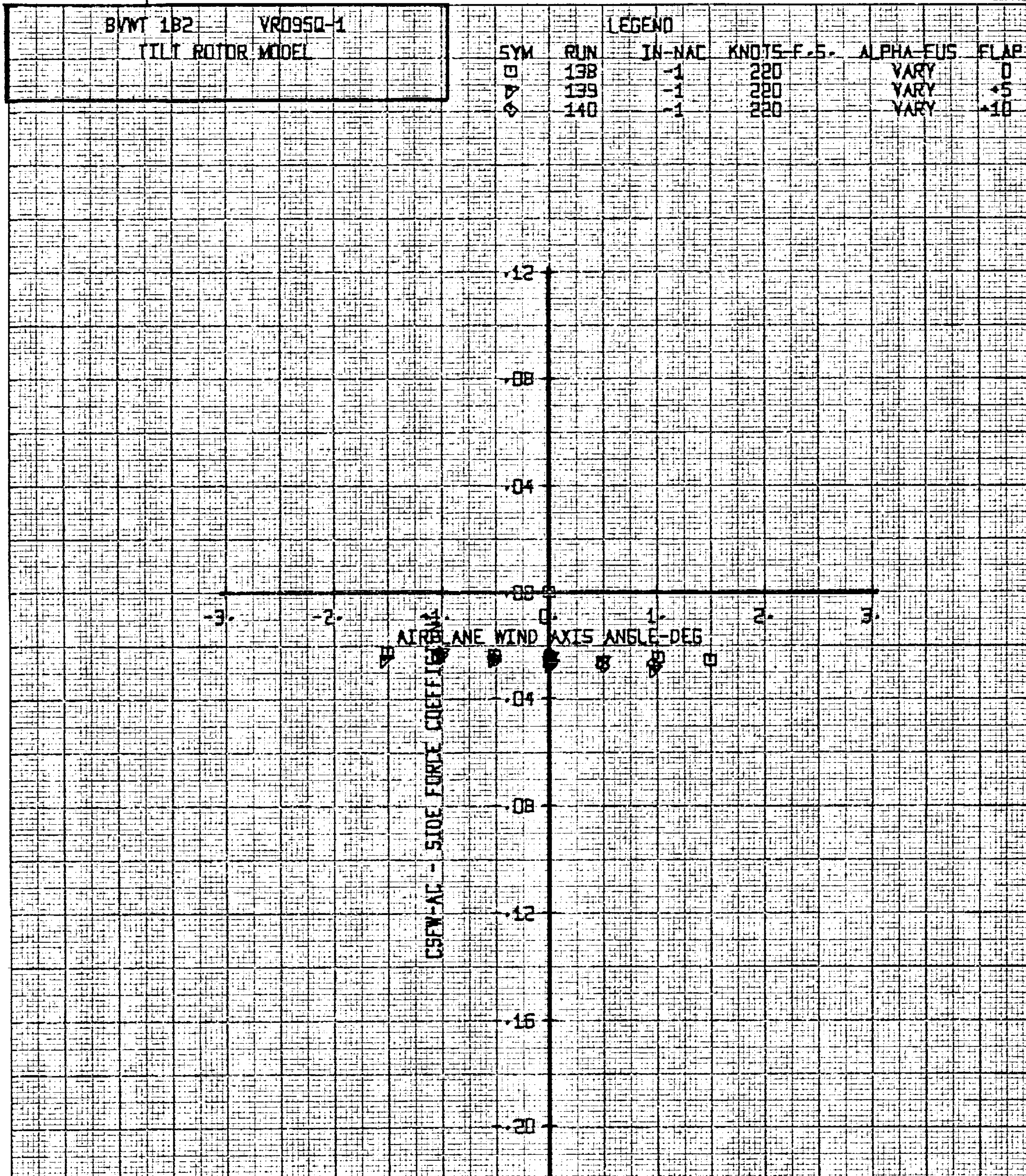


Figure 15-014. Aircraft Side Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$

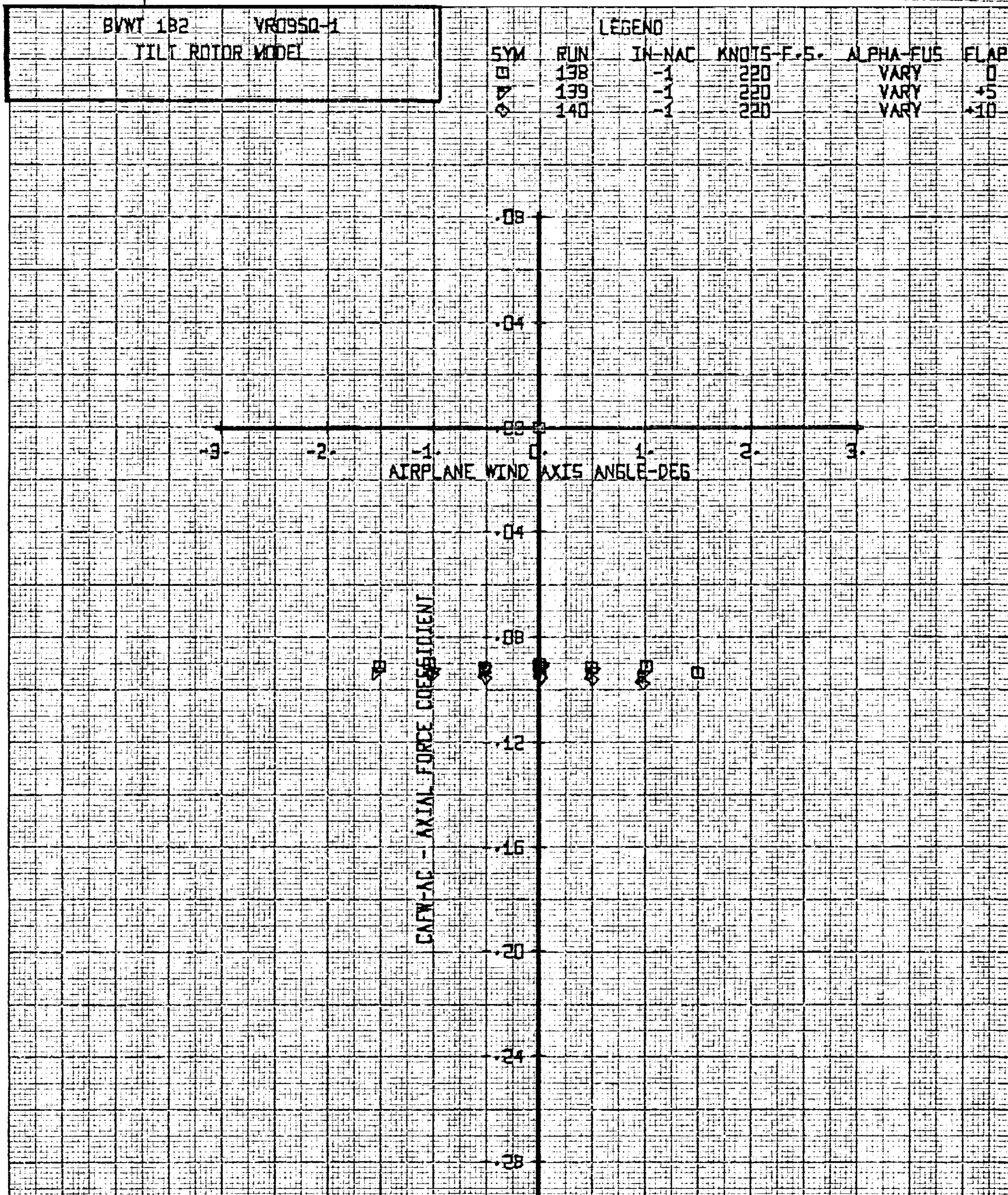


Figure 15-015. Aircraft Axial Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$

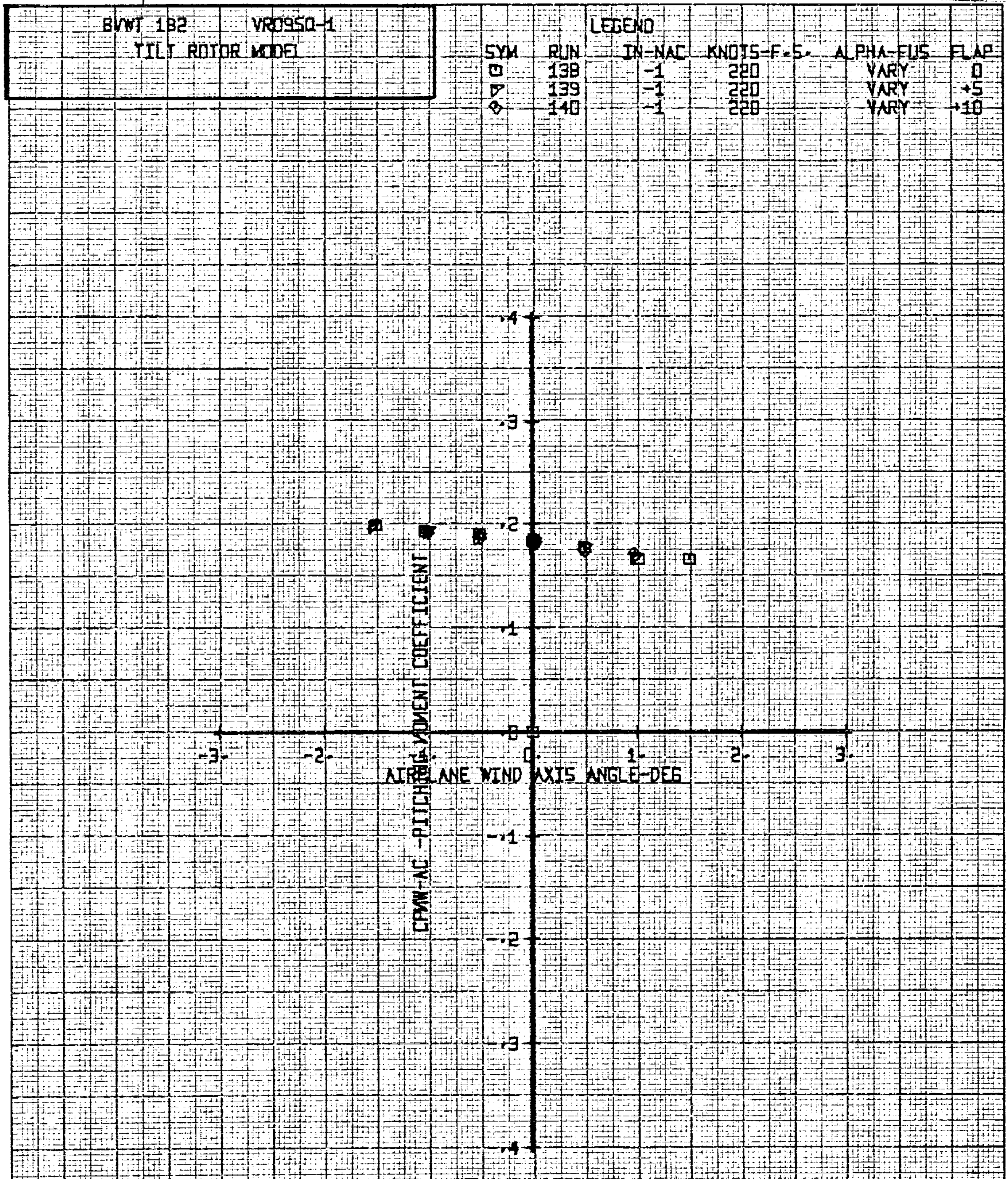


Figure 15-016 . Aircraft Pitching Moment Versus Angle of Attack.
$I_N = -1°$ Full Scale Airspeed 220 Knots.
$\delta_F = 0°, 5°, 10°$

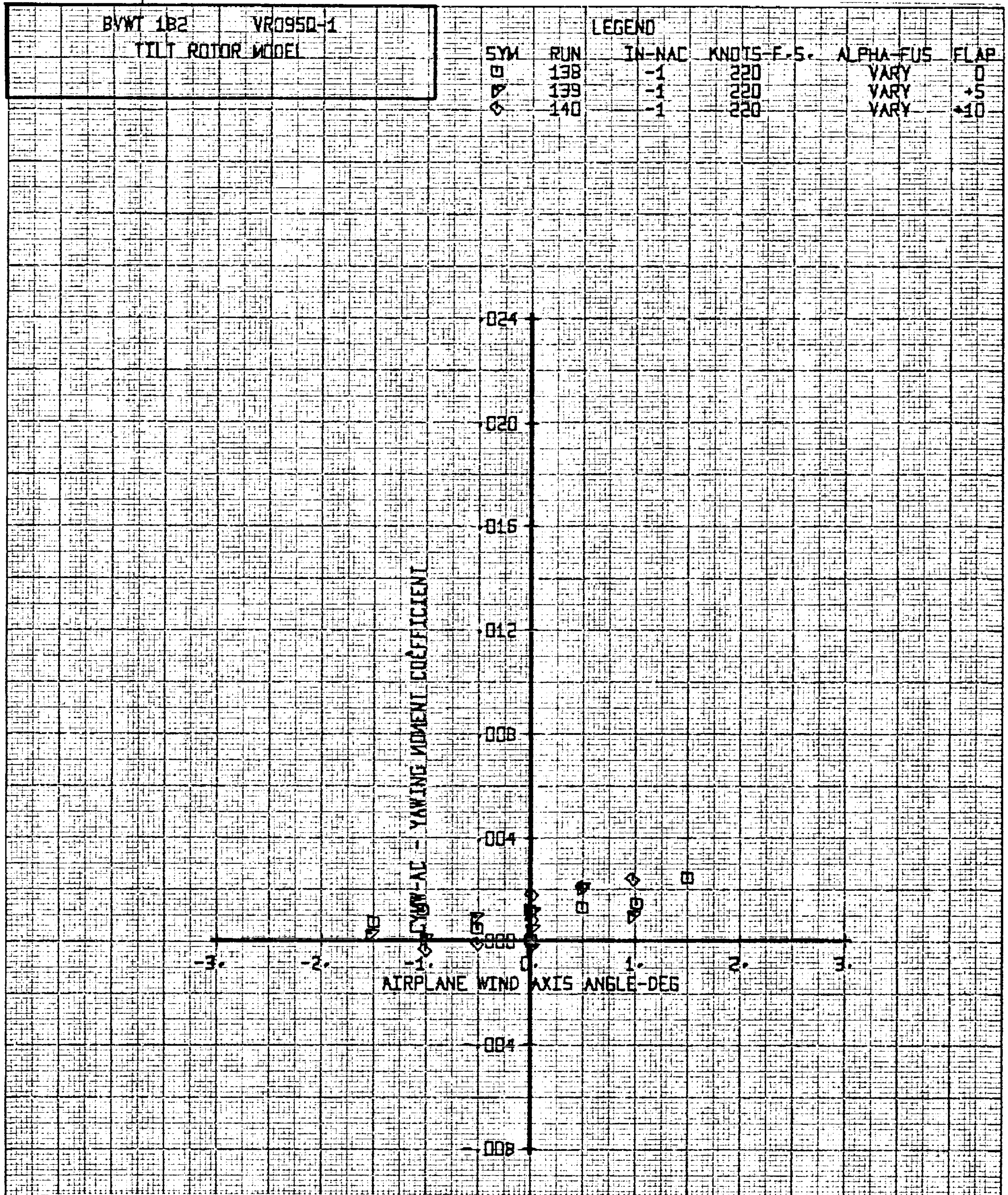


Figure 15-017. Aircraft Yawing Moment Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$

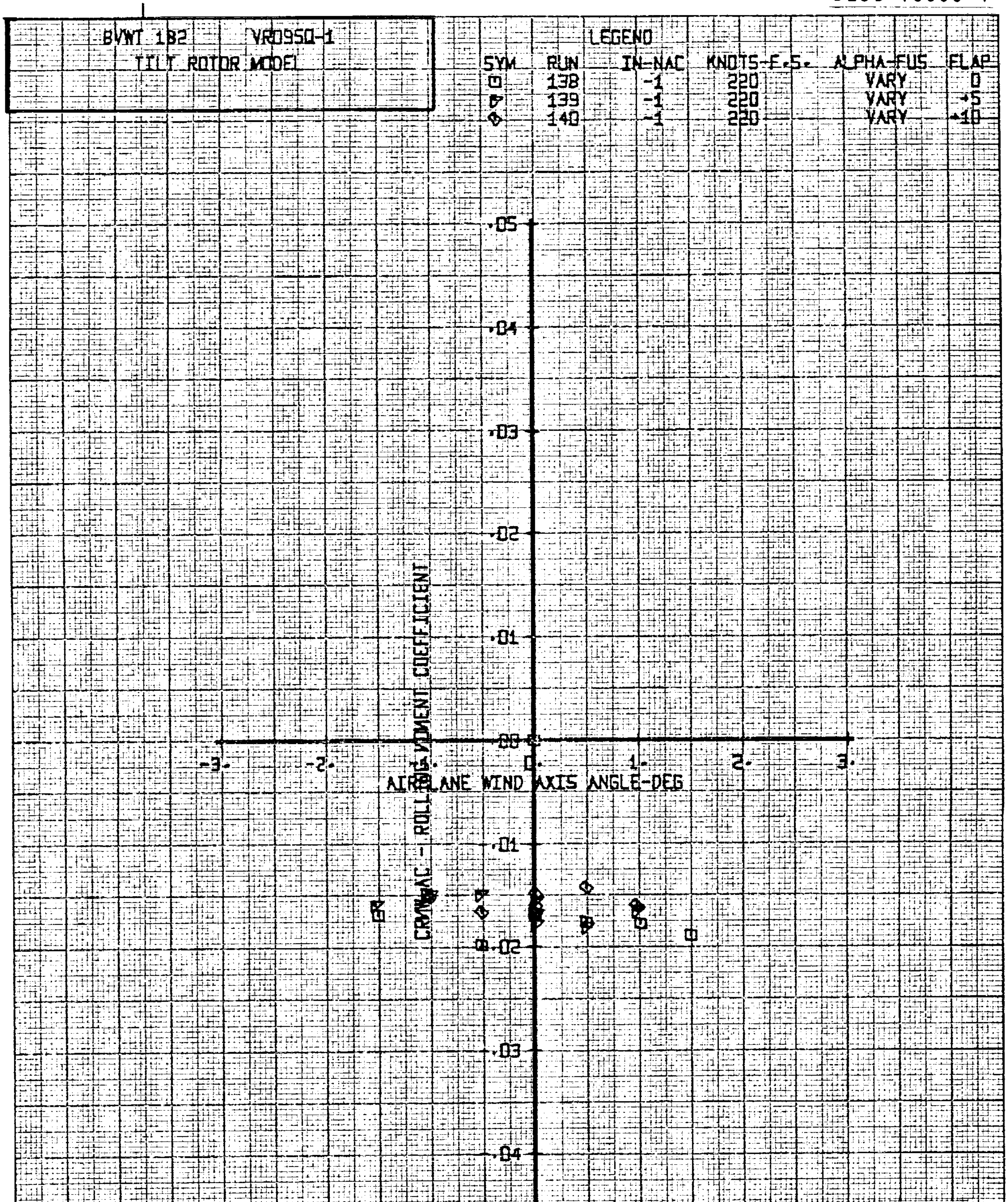


Figure 15-018. Aircraft Rolling Moment Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$

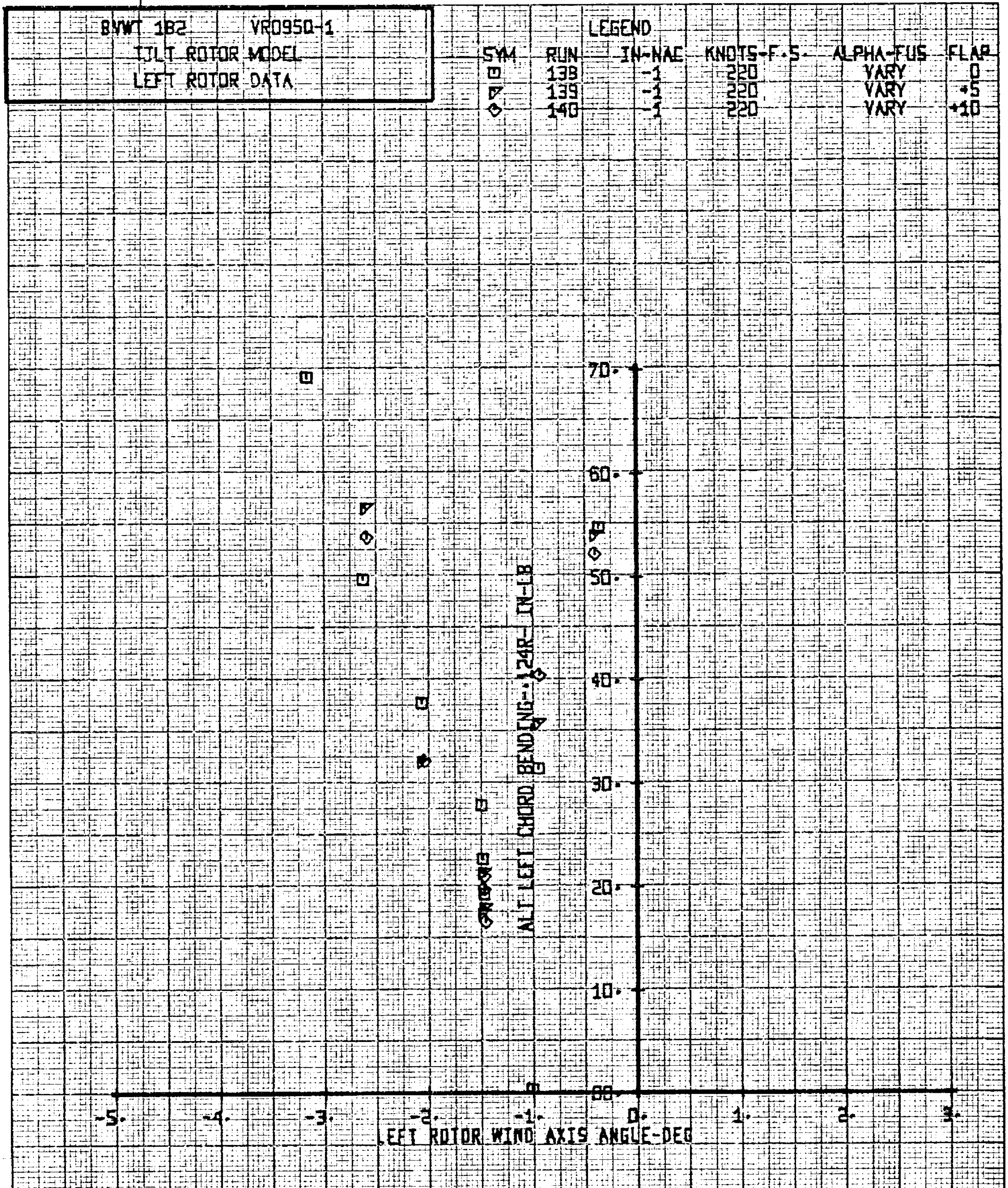


Figure 15-019. Alt. Left Chord Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$

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LEGEND

SYM	RUN	IN-NAC	KNOTS-F-S	ALPHA-FUS	FLAP
⊡	138	-1	220	VARY	0
▽	139	-1	220	VARY	5
◇	140	-1	220	VARY	10

Figure 15-020. Alt. Left Flap Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$

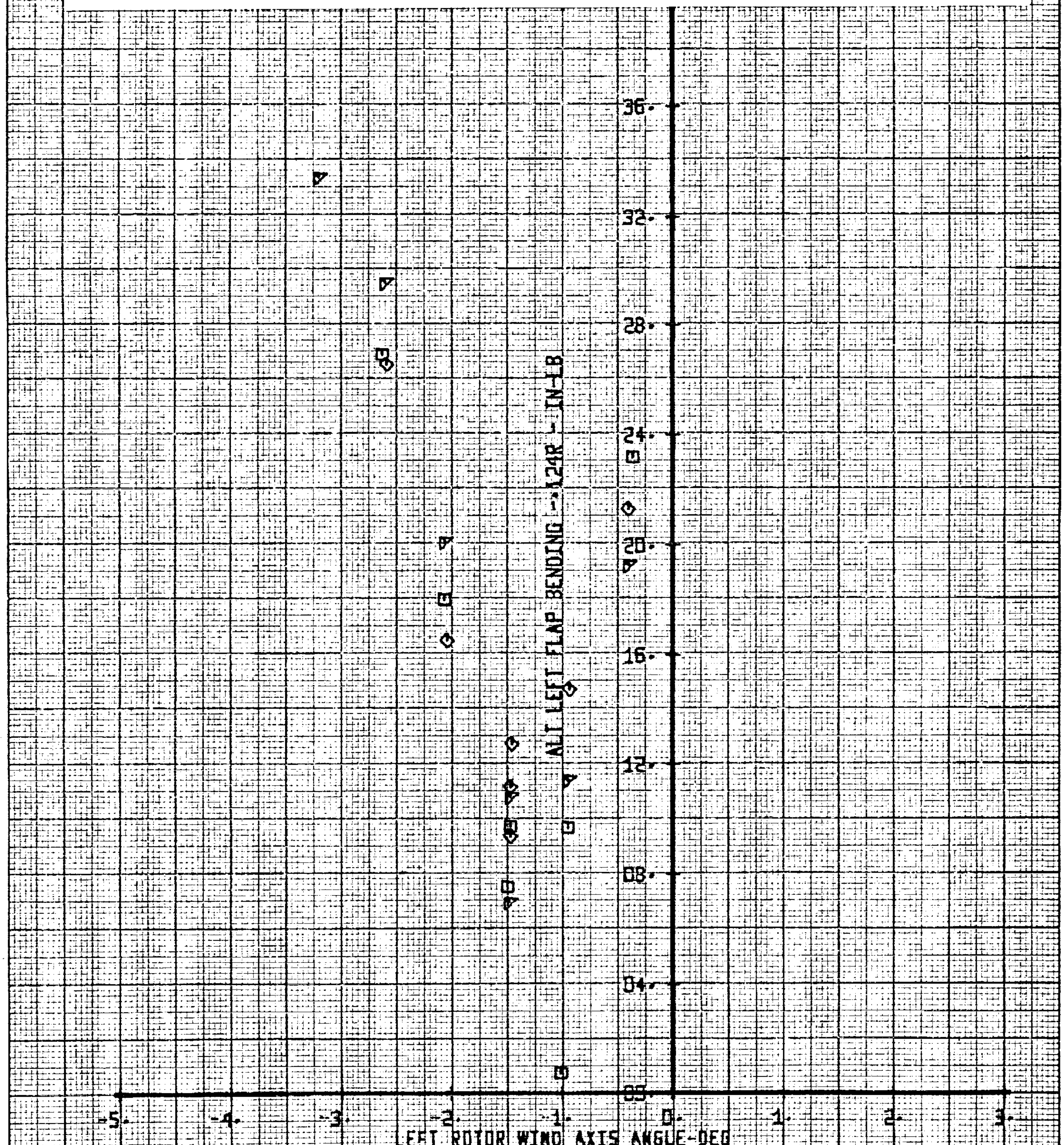

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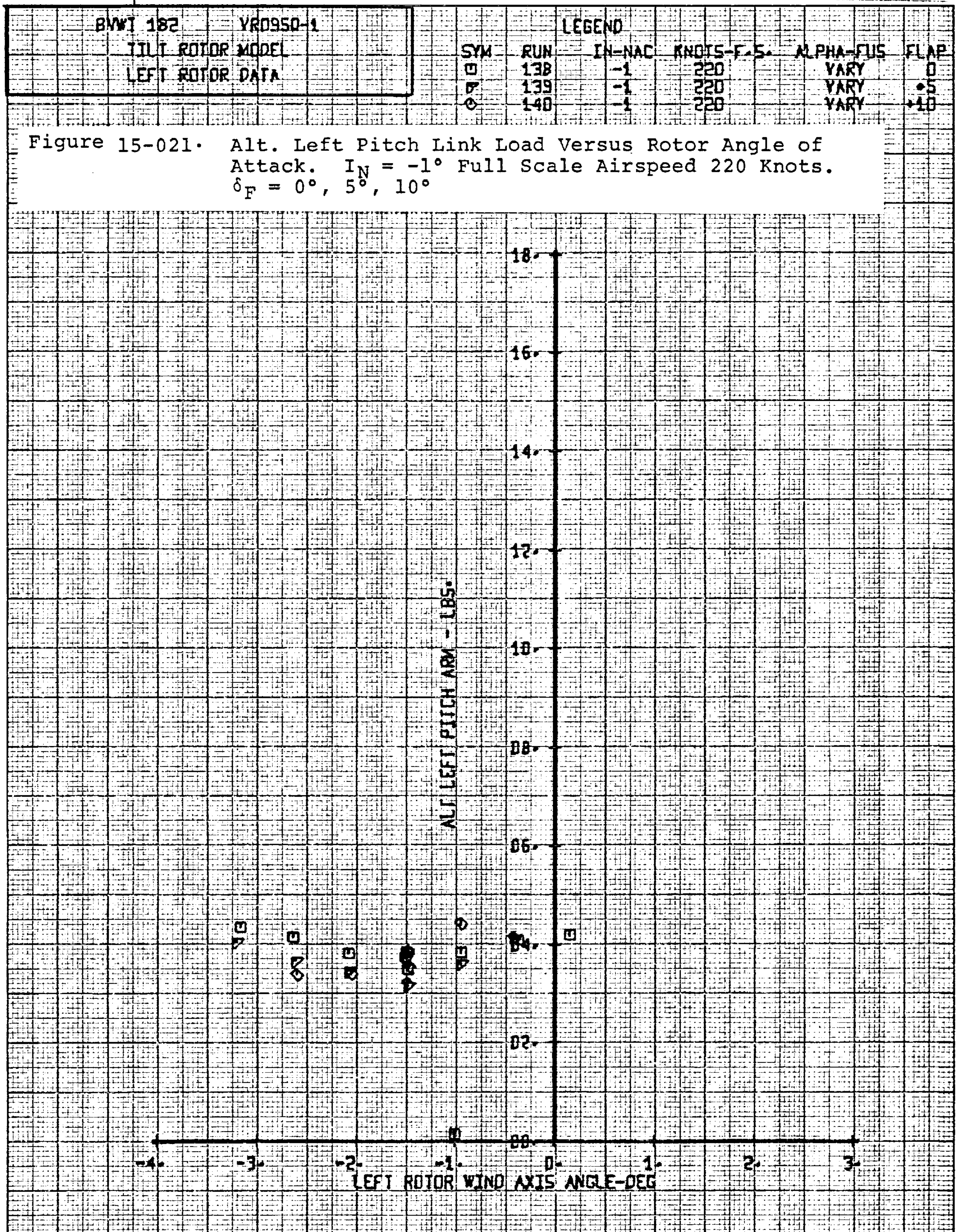
Figure 15-021. Alt. Left Pitch Link Load Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$



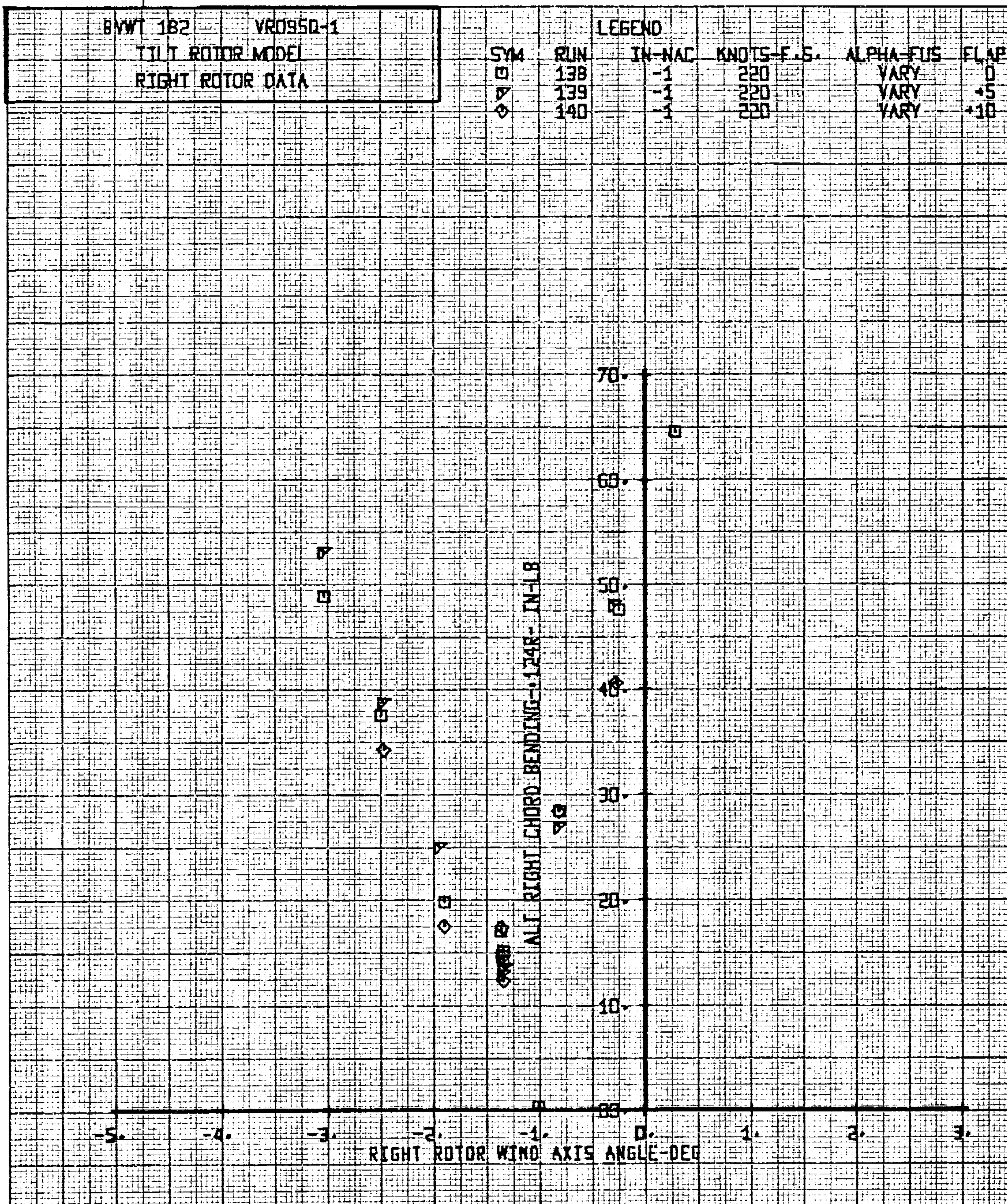


Figure 15-022. Alt. Right Chord Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$

Figure 15-023. Alt. Right Flap Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$

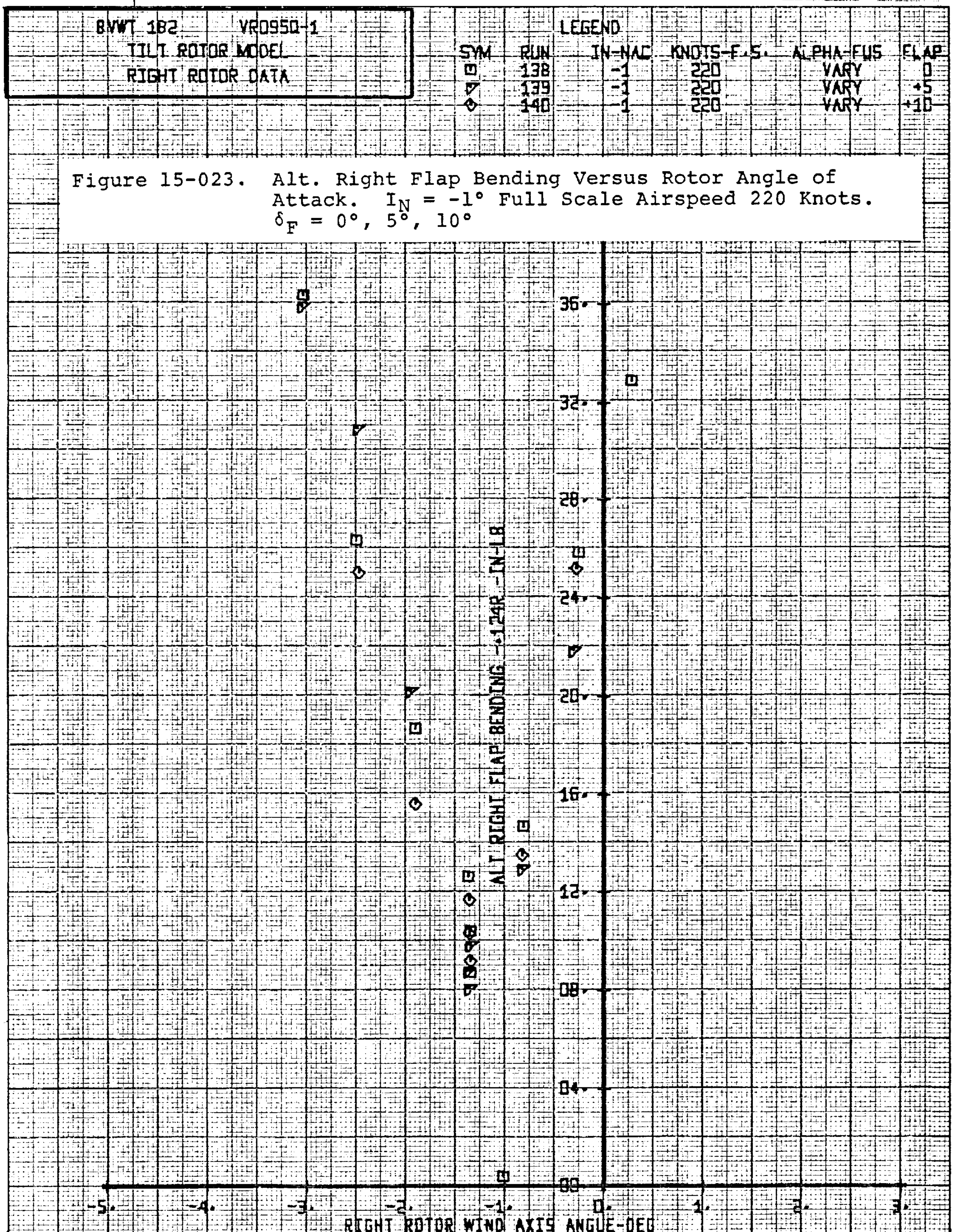


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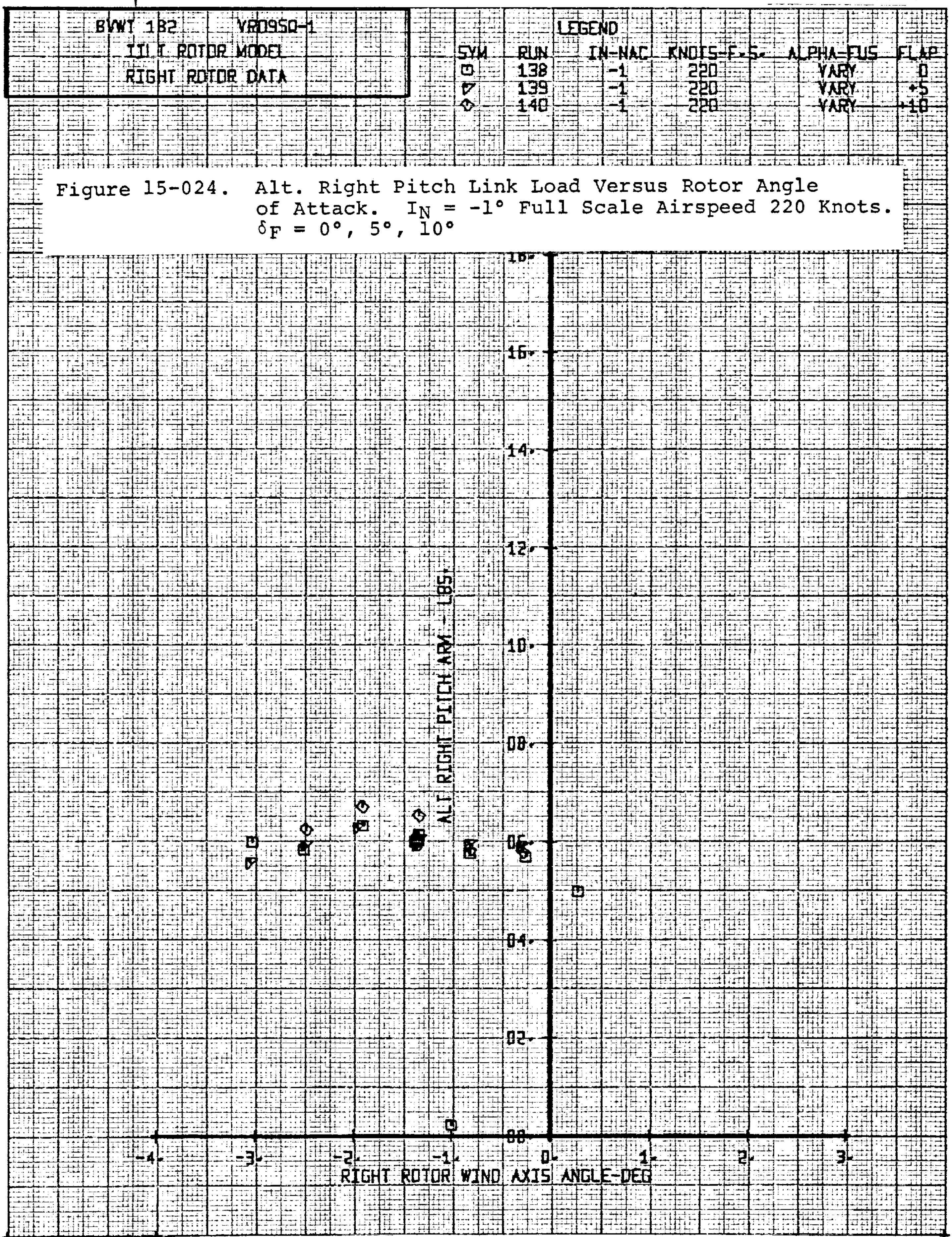
Figure 15-024. Alt. Right Pitch Link Load Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 220 Knots. $\delta_F = 0°, 5°, 10°$



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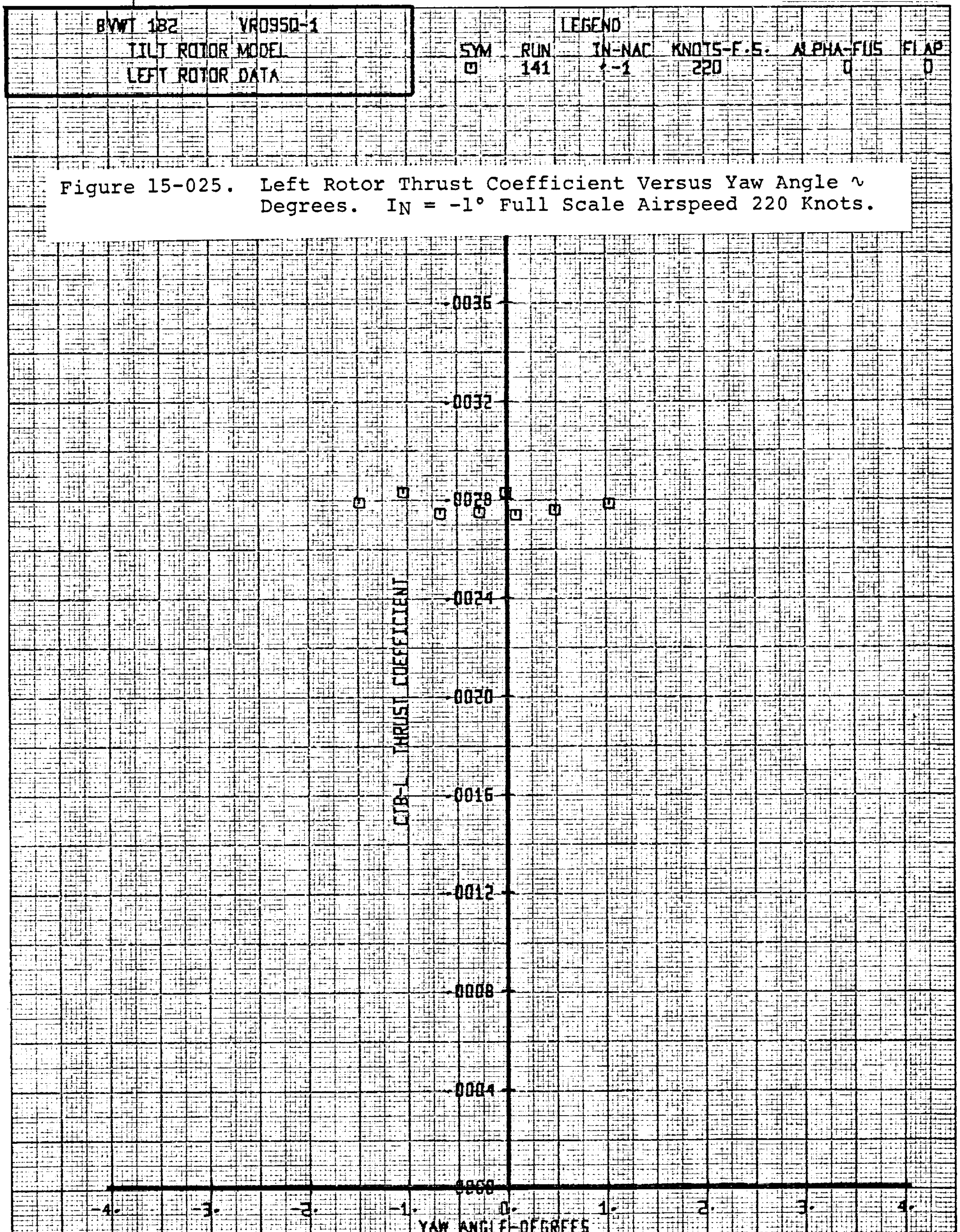

Figure 15-025. Left Rotor Thrust Coefficient Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.

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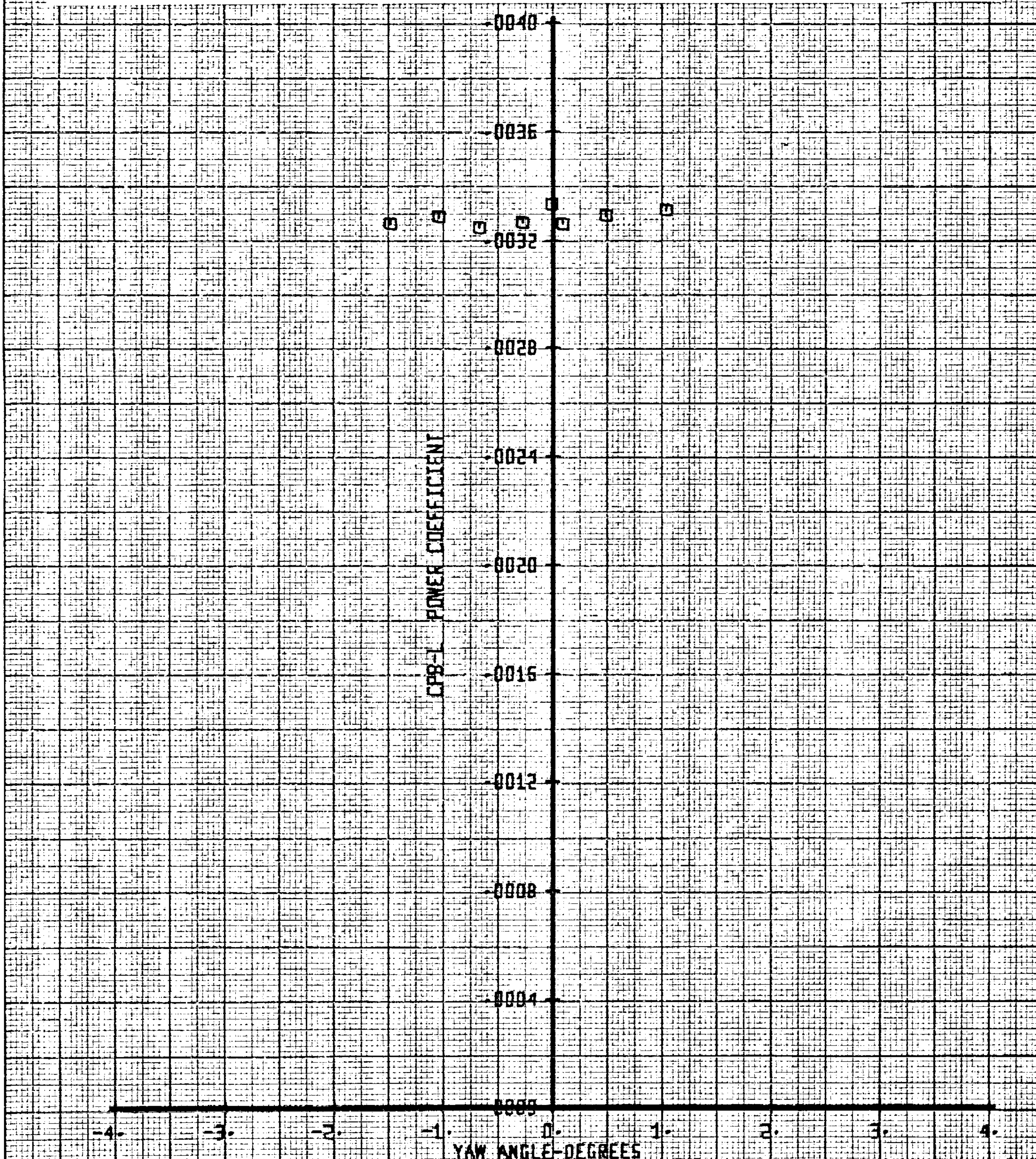
LEFT ROTOR DATA

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	141	-1	220	0	0

Figure 15-026. Left Rotor Power Coefficient Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.



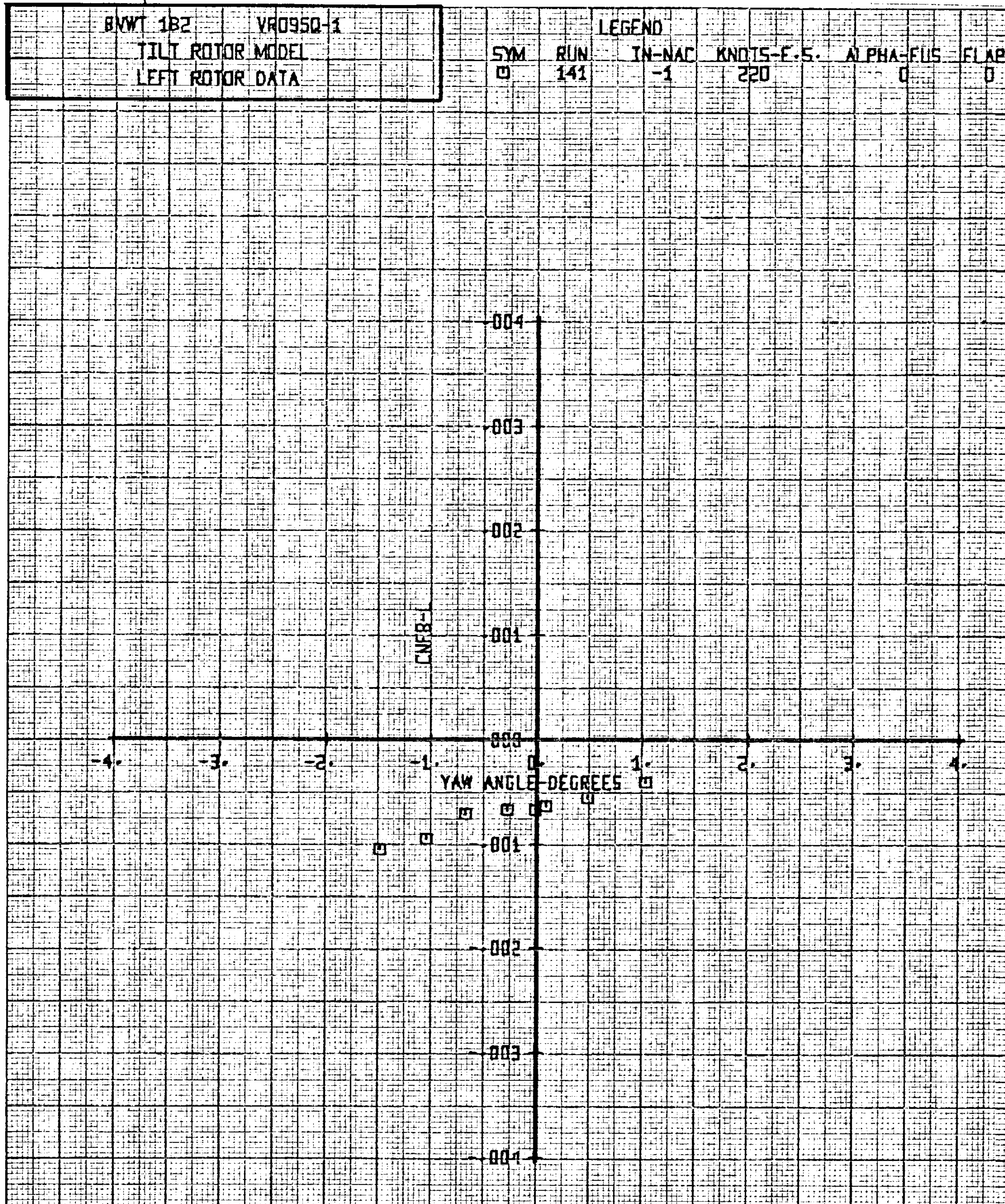


Figure 15-027. Left Rotor Normal Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

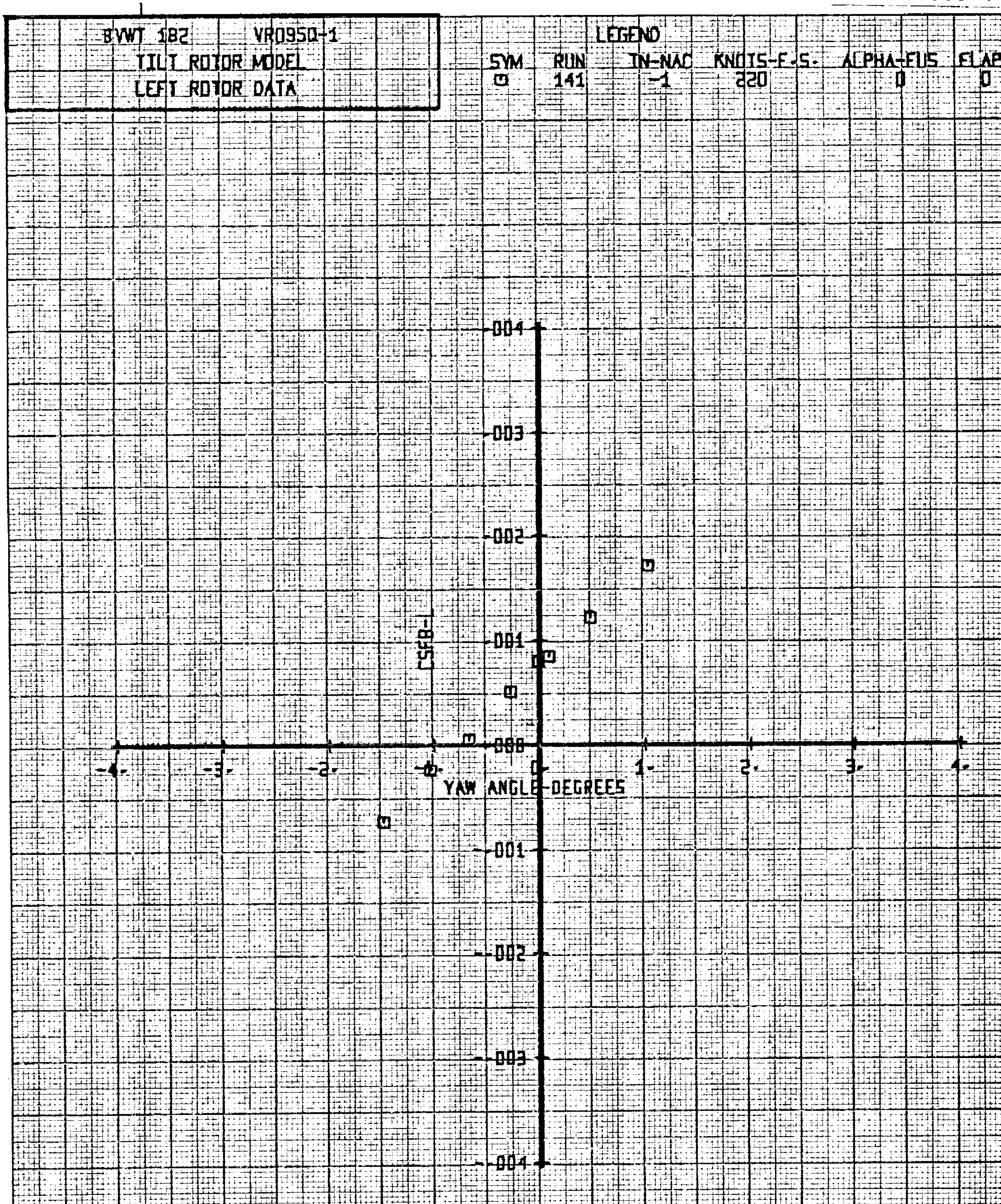


Figure 15-028. Left Rotor Side Force Coefficient Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

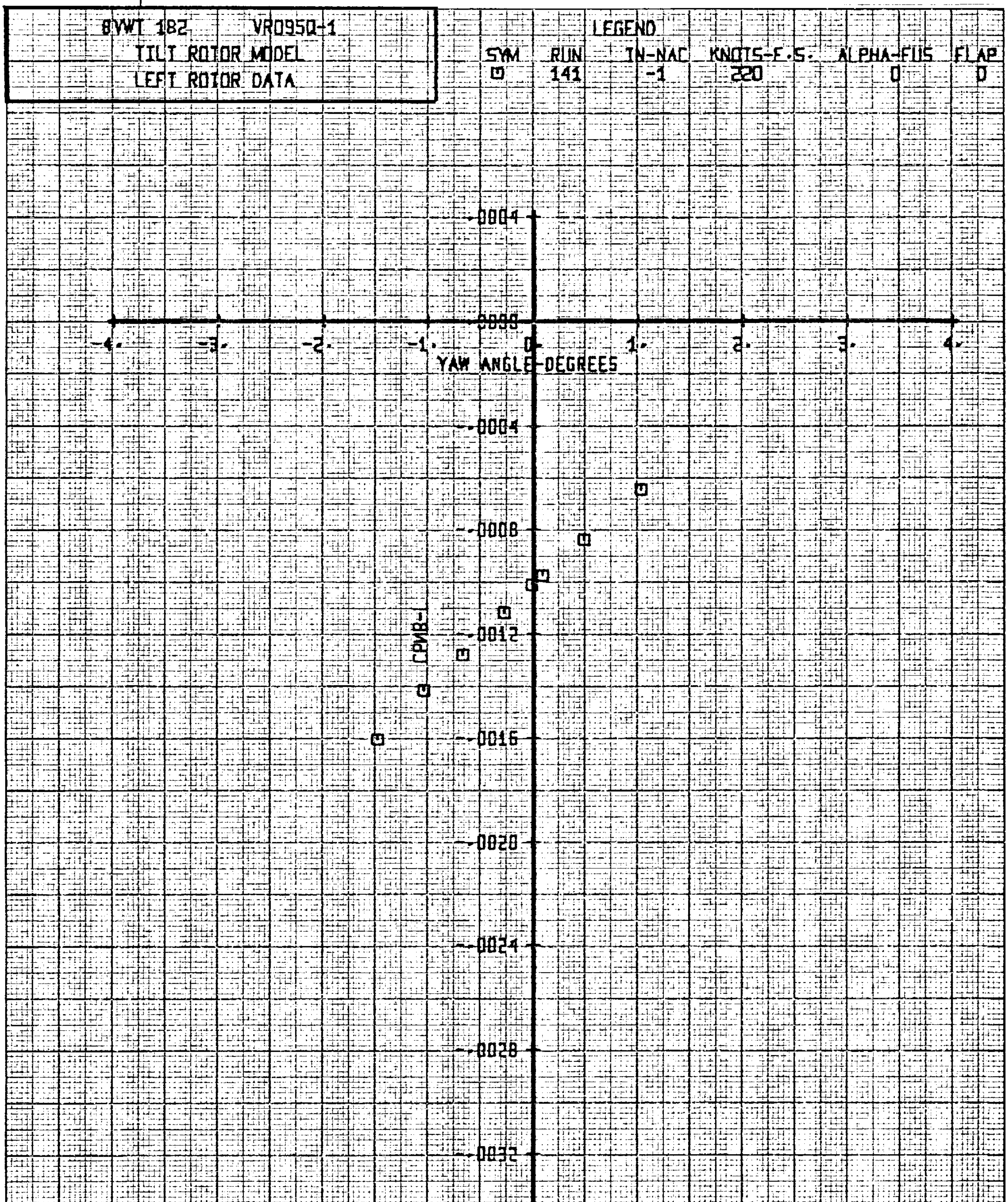


Figure 15-029. Left Rotor Pitching Moment Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.

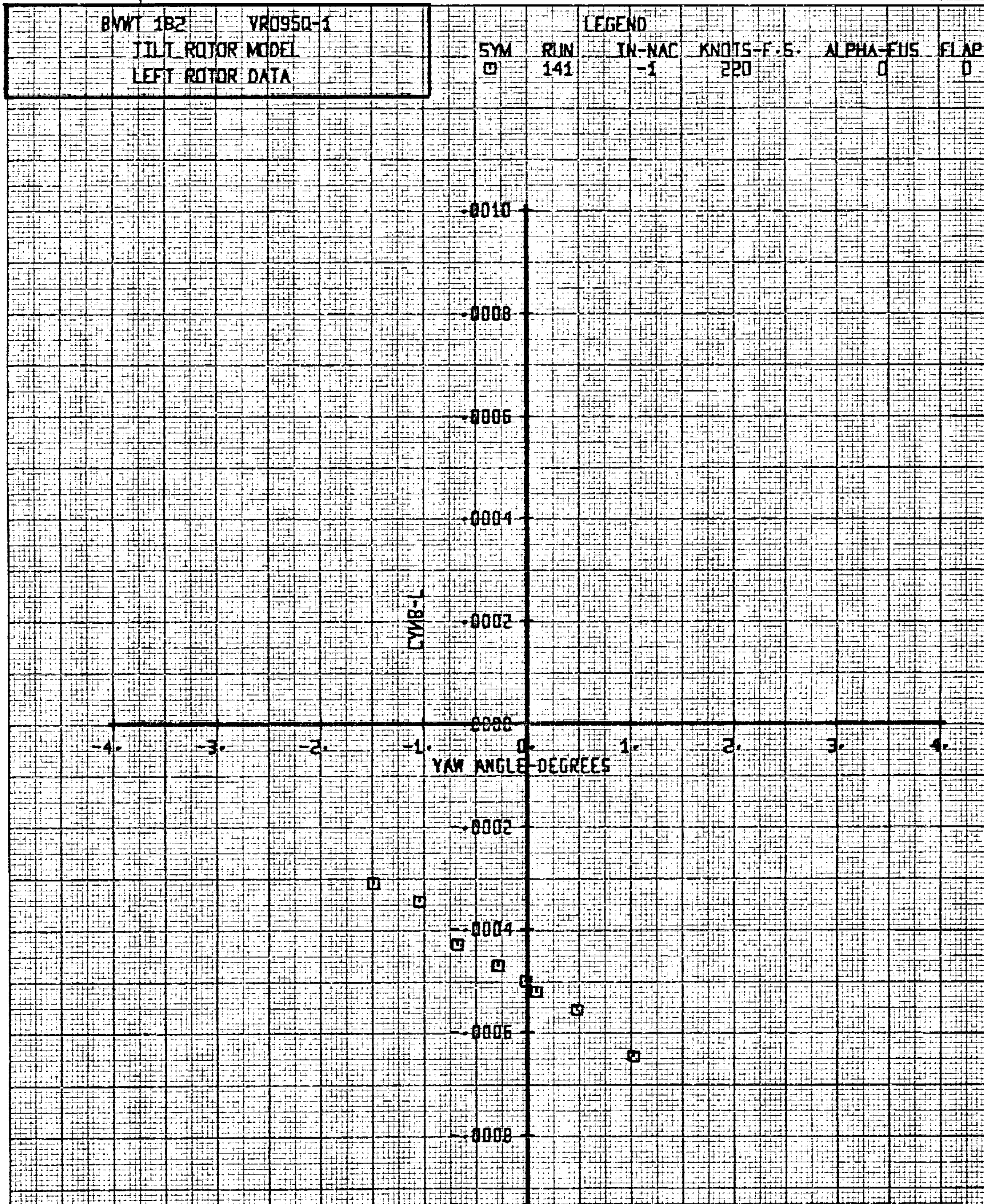


Figure 15-030. Left Rotor Yawing Moment Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.

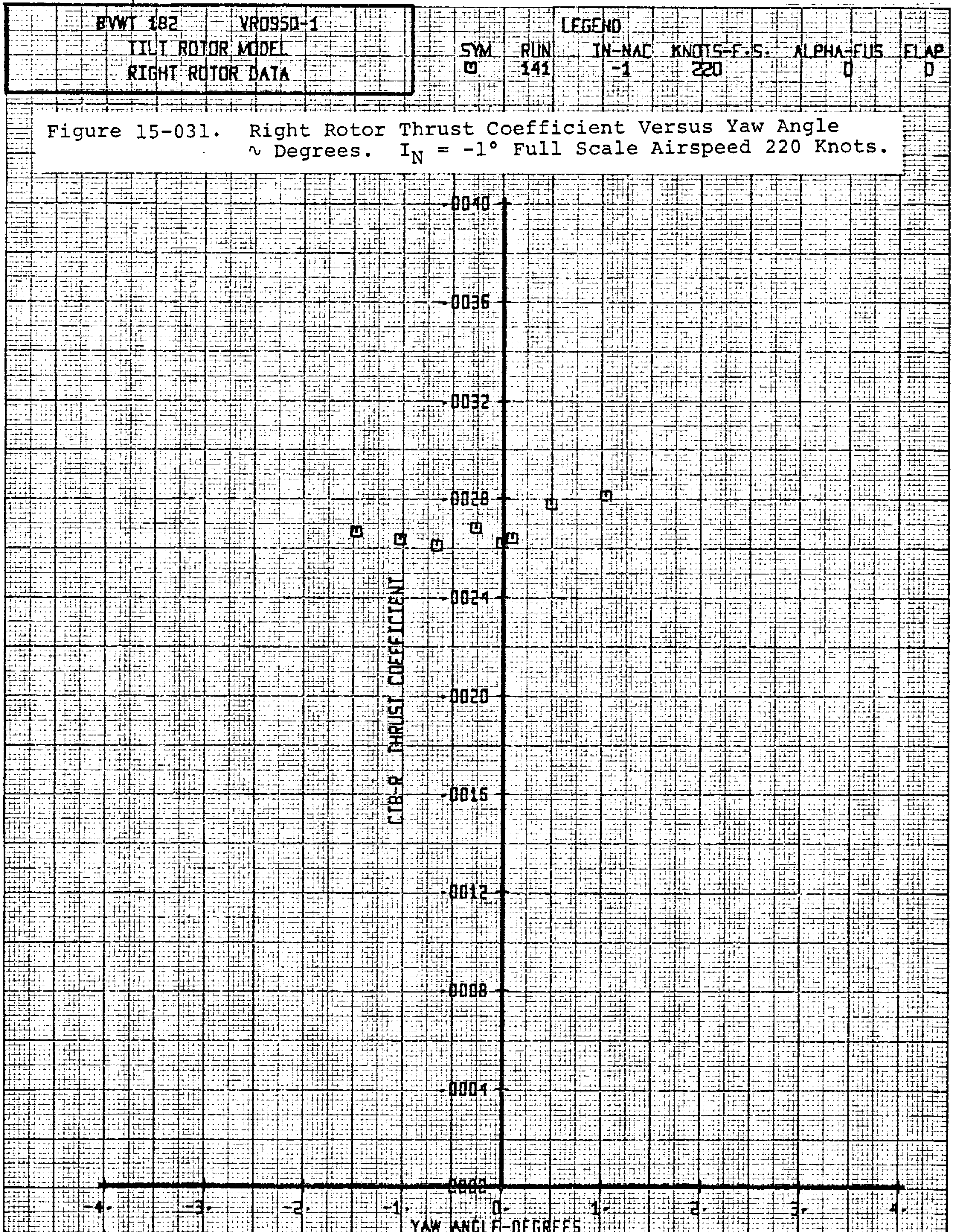
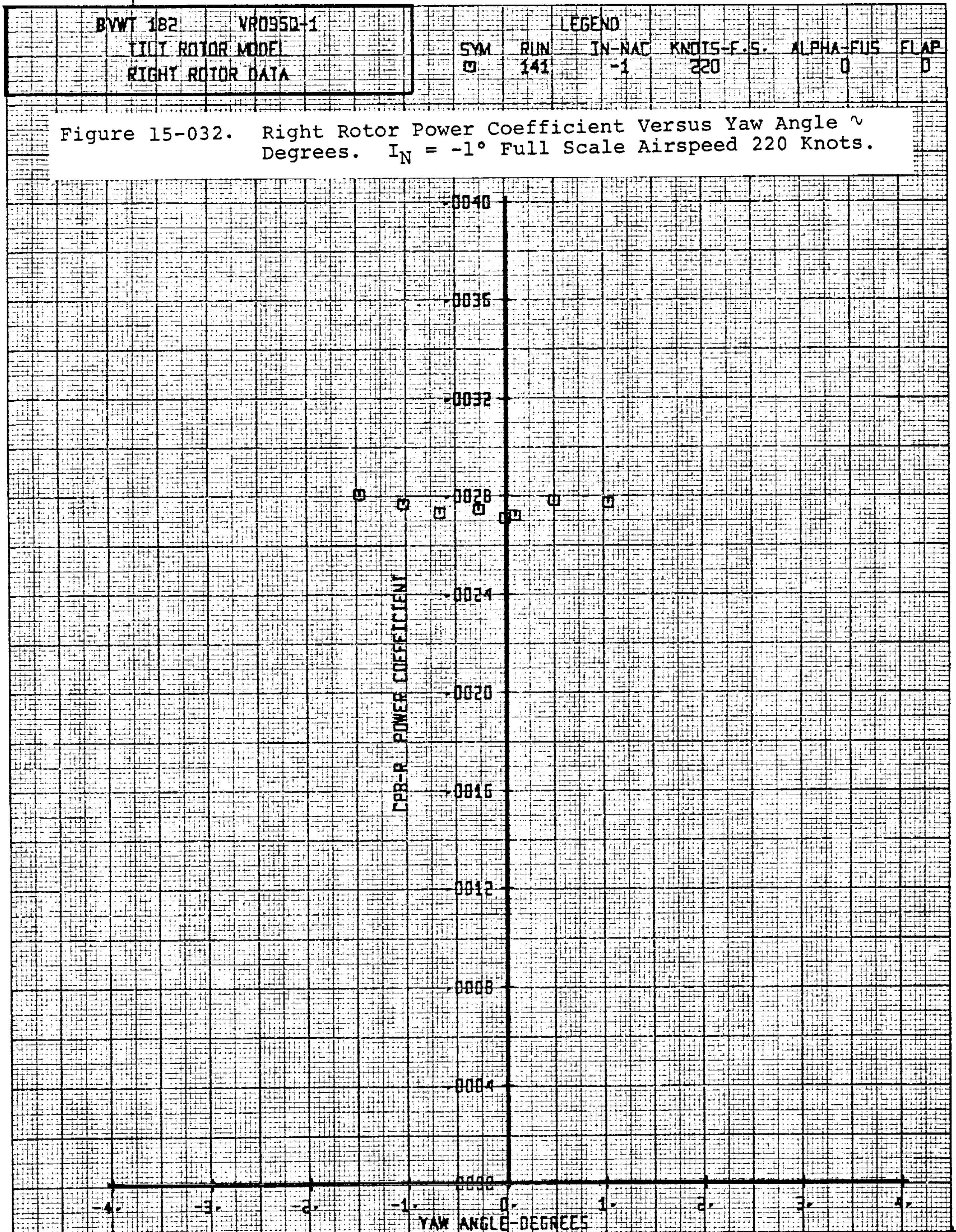


Figure 15-031. Right Rotor Thrust Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

Figure 15-032. Right Rotor Power Coefficient Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.



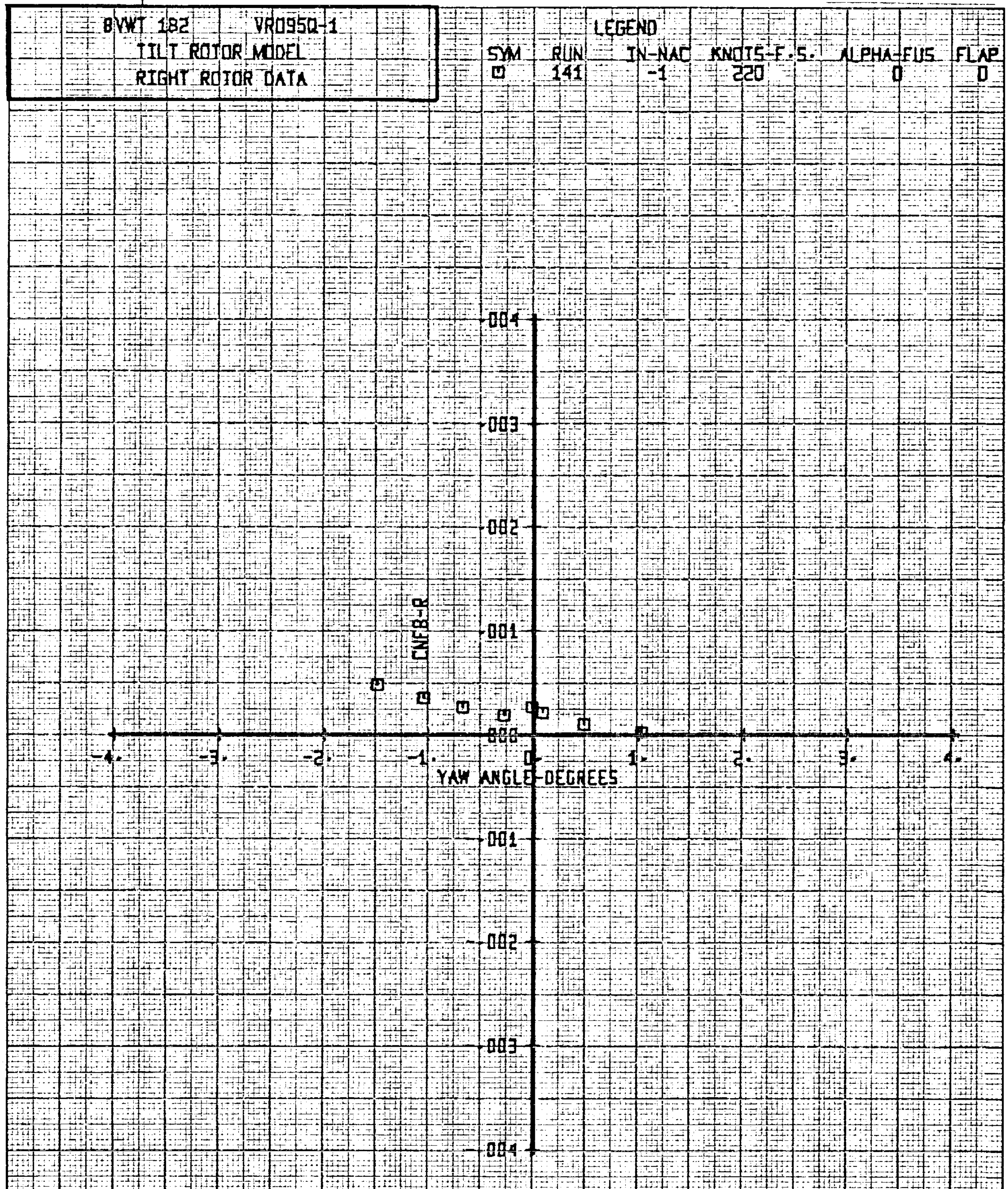


Figure 15-033. Right Rotor Normal Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

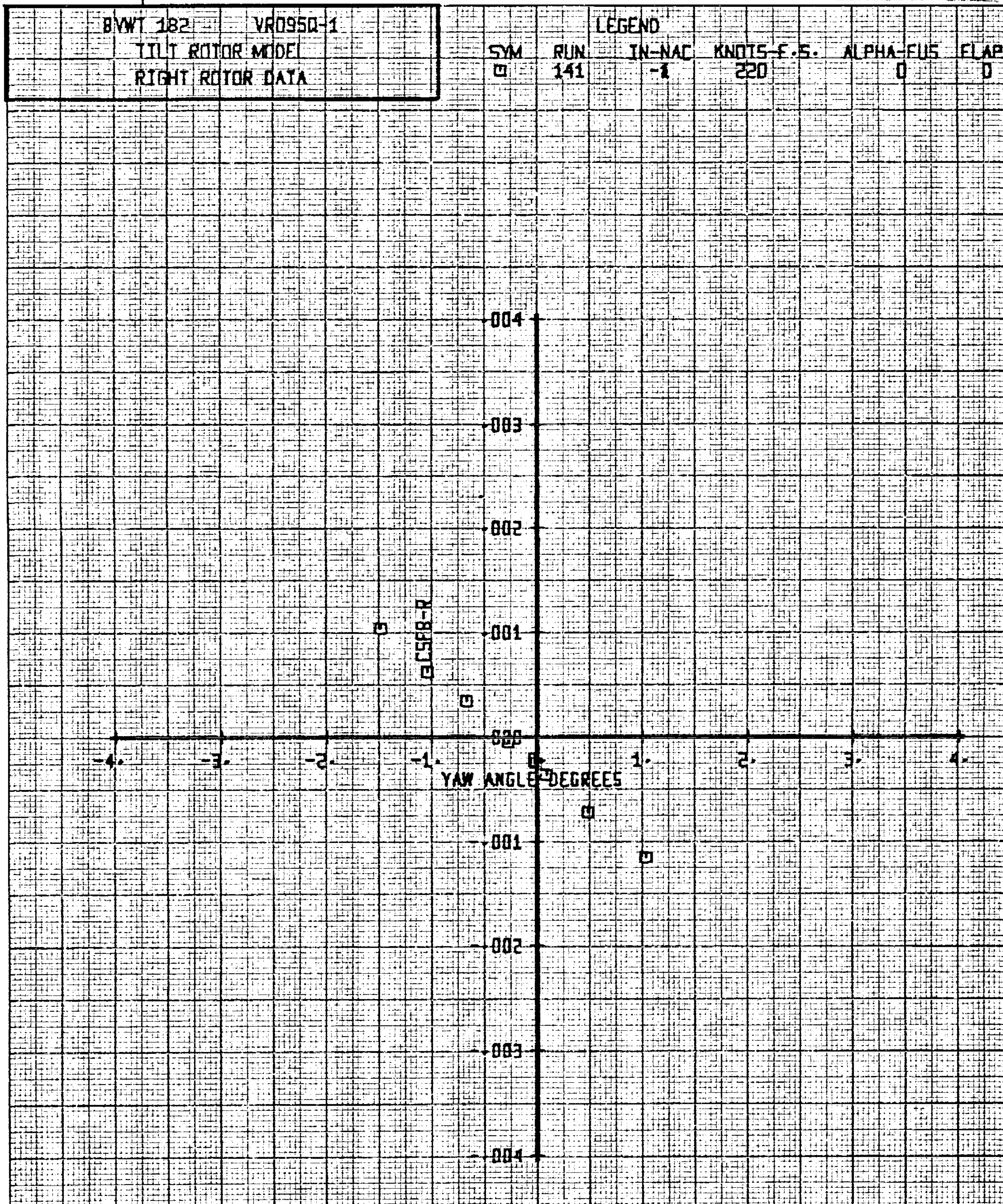


Figure 15-034. Right Rotor Side Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

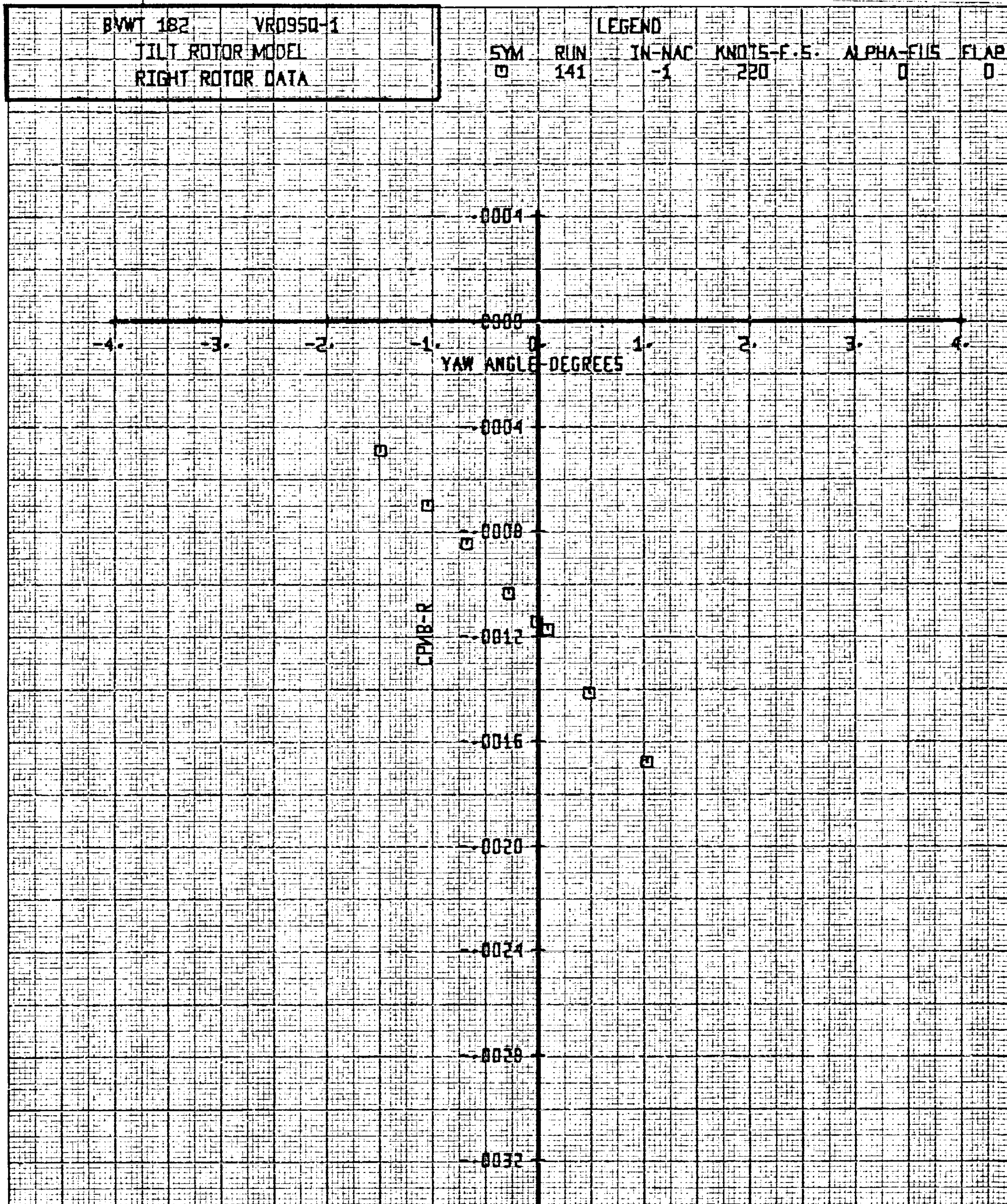


Figure 15-035. Right Rotor Pitching Moment Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.

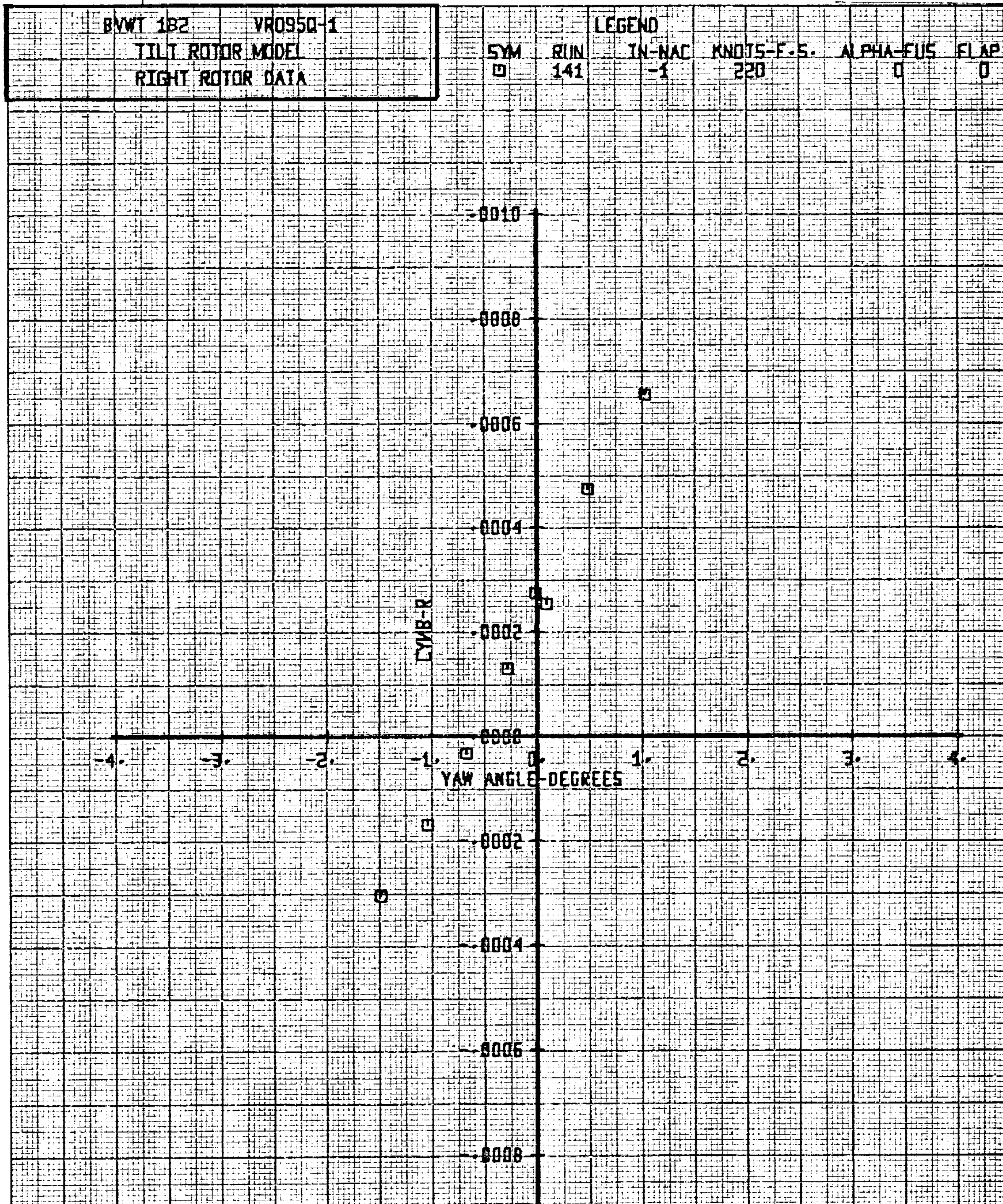


Figure 15-036. Right Rotor Yawing Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

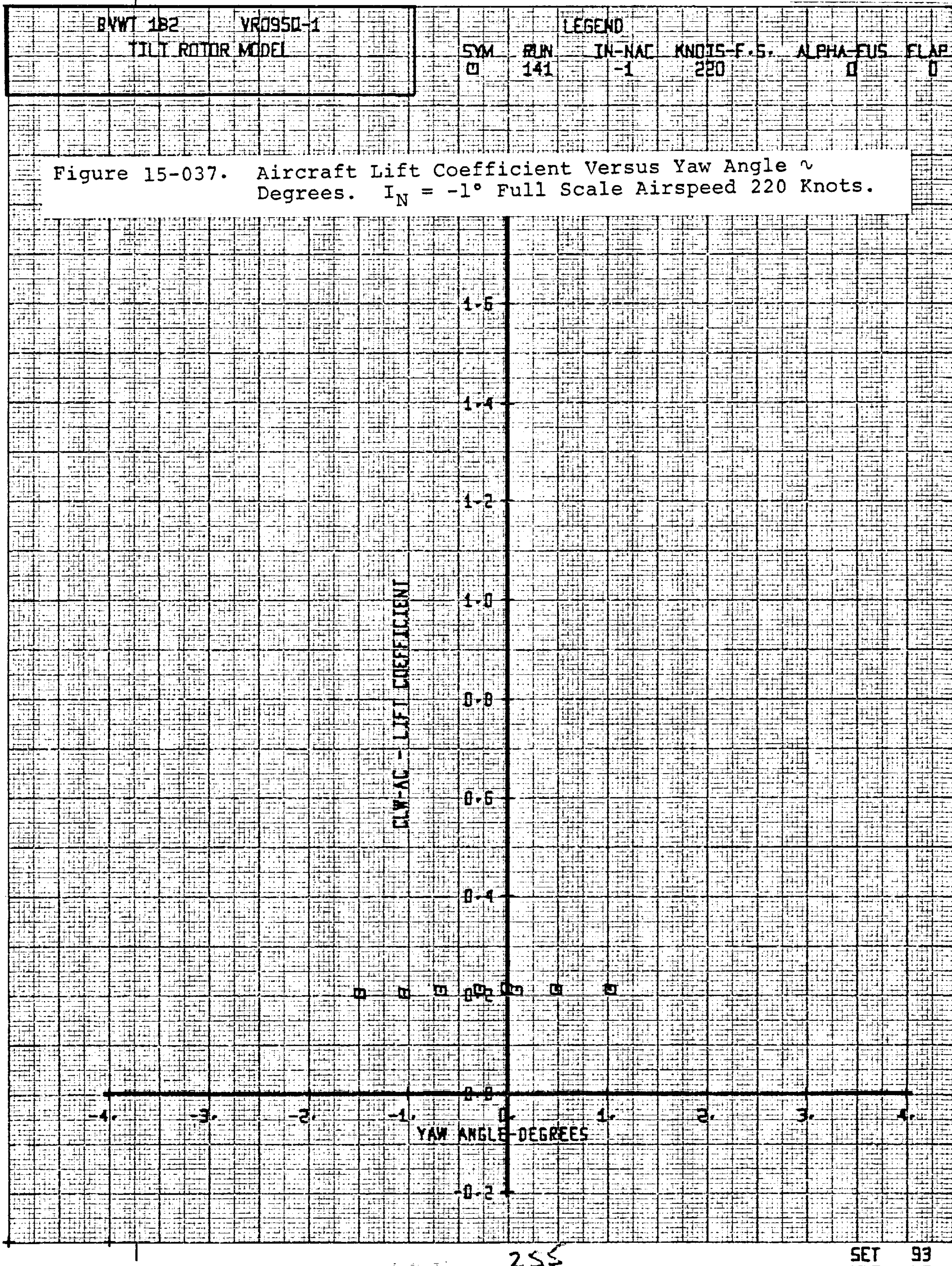


Figure 15-037. Aircraft Lift Coefficient Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

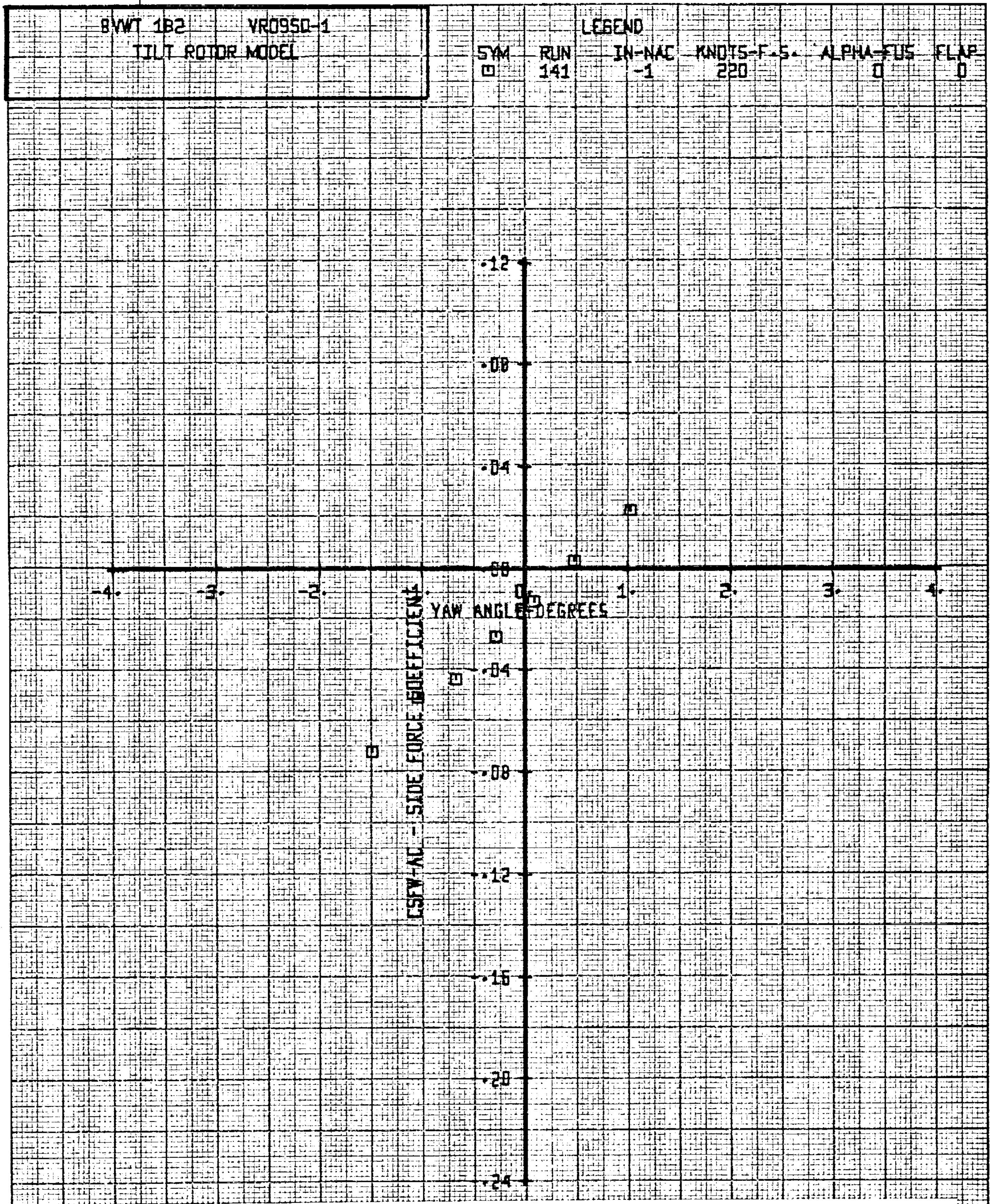


Figure 15-038. Aircraft Side Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

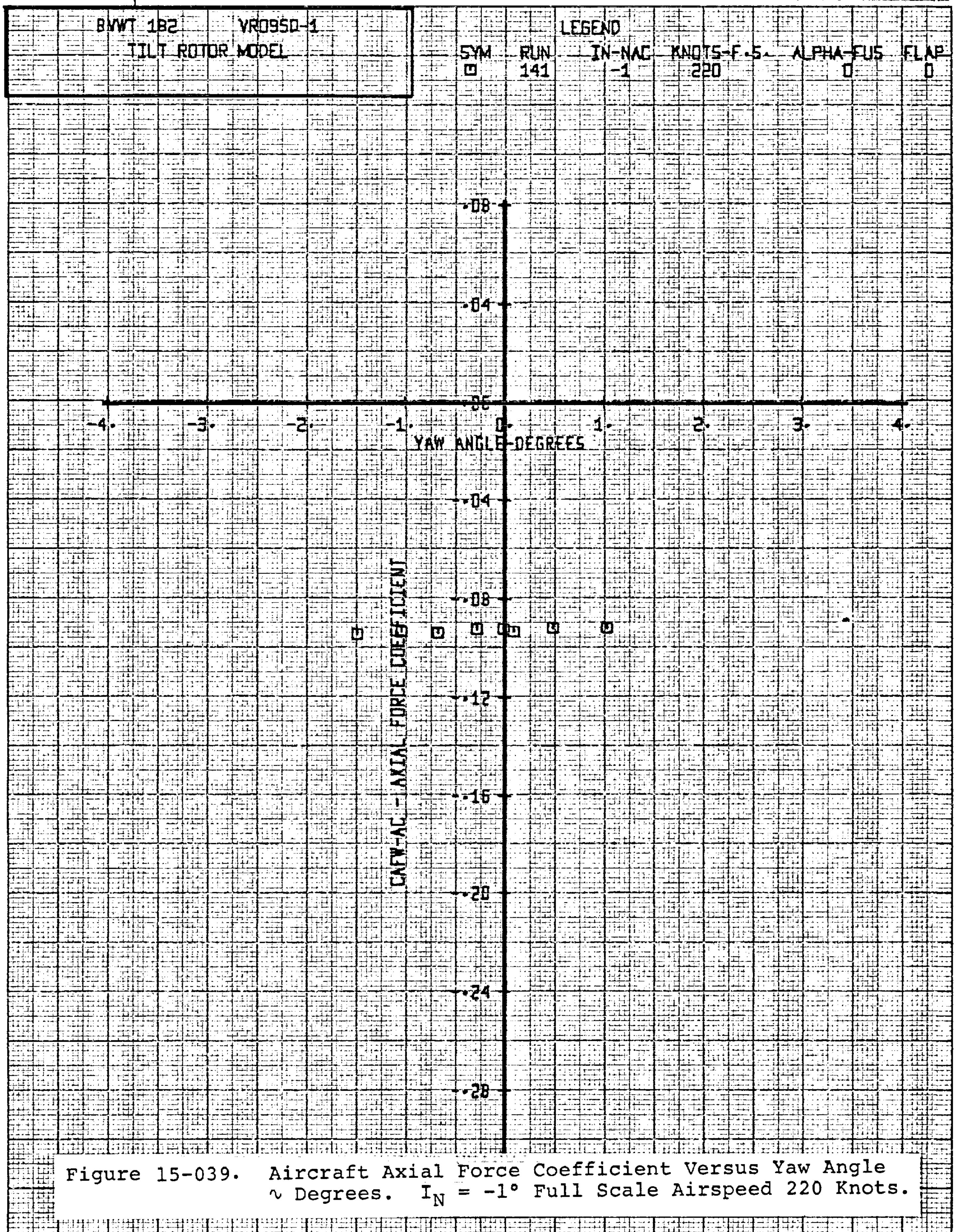


Figure 15-039. Aircraft Axial Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

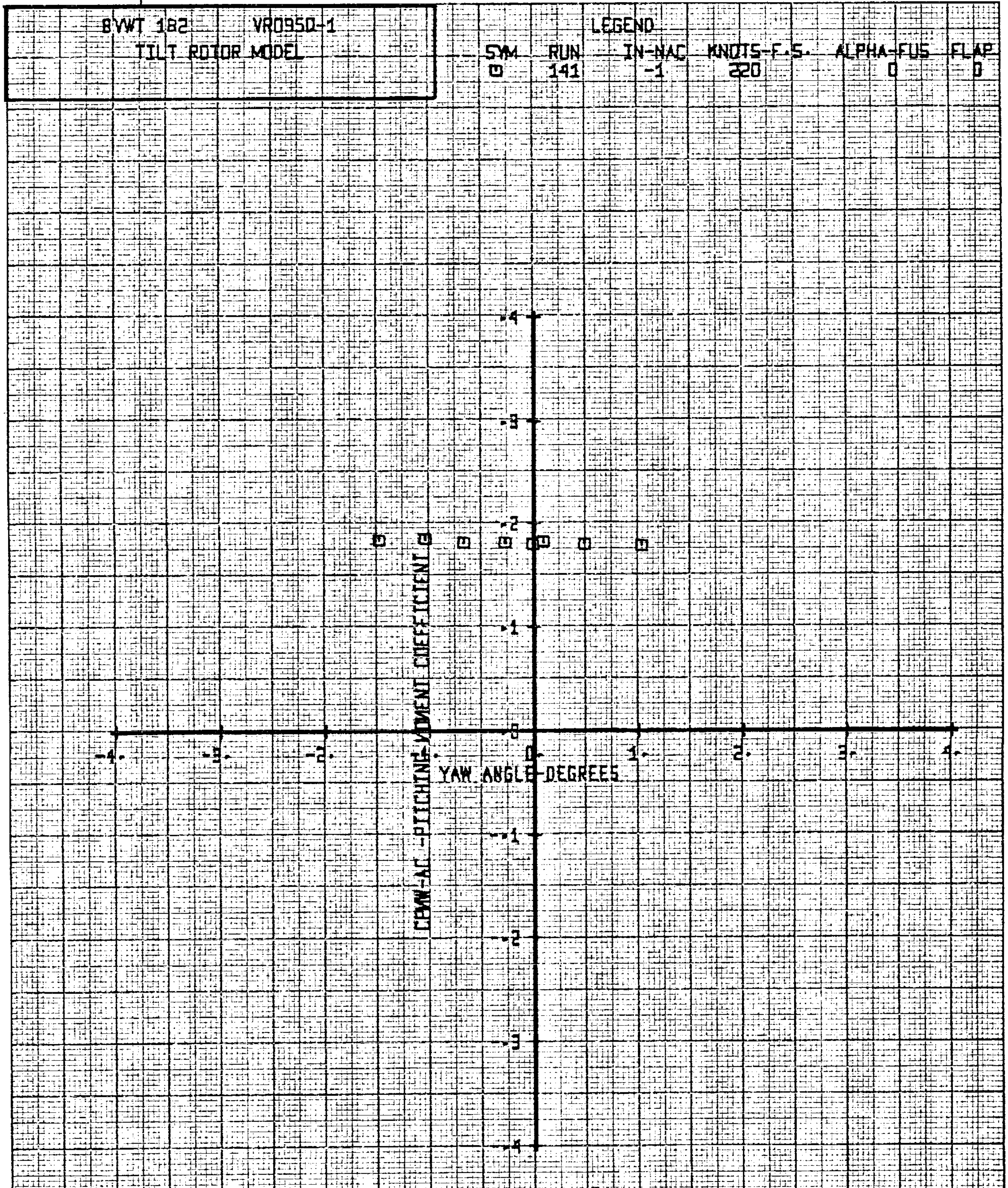


Figure 15-040. Aircraft Pitching Moment Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.

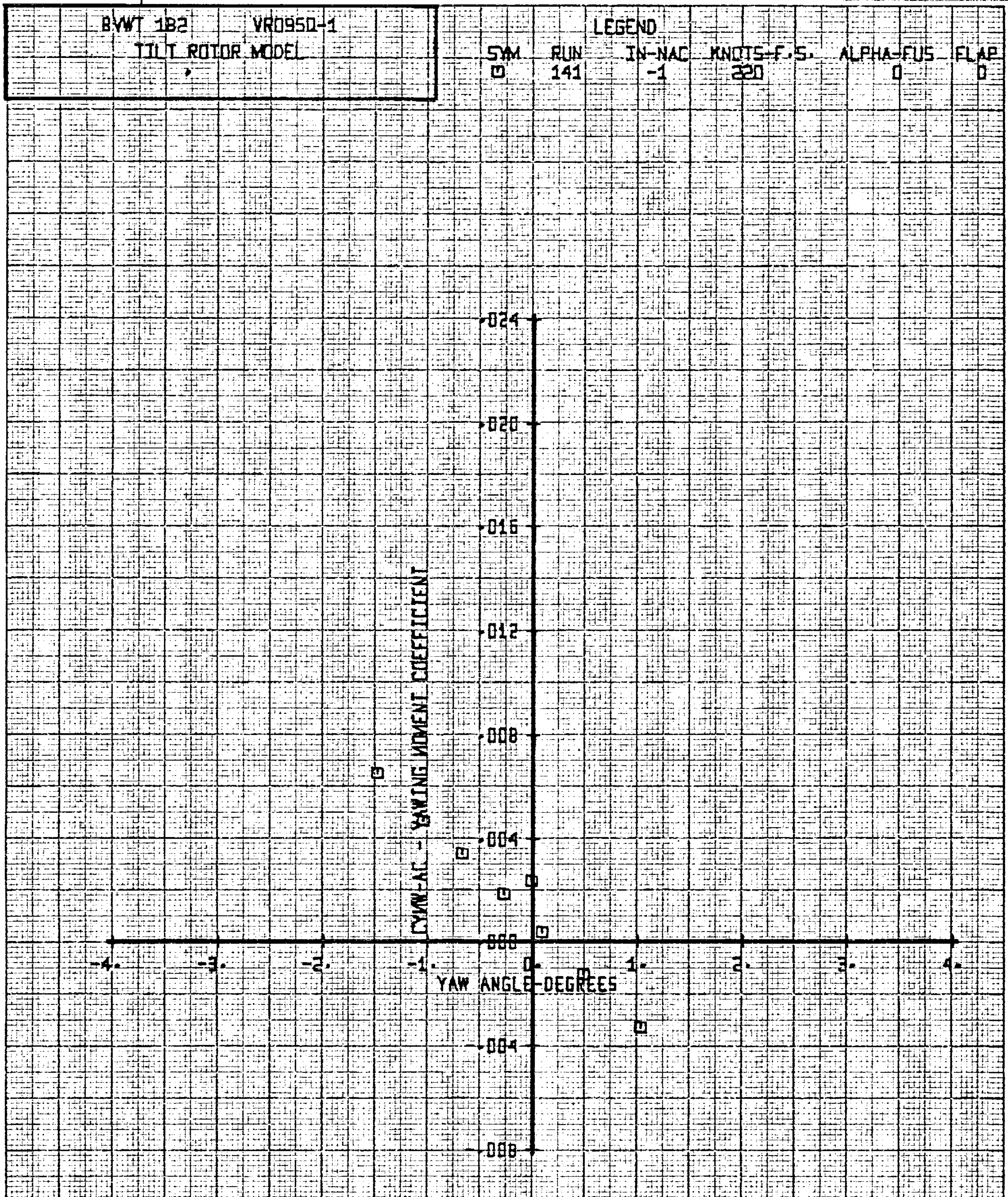


Figure 15-041. Aircraft Yawing Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

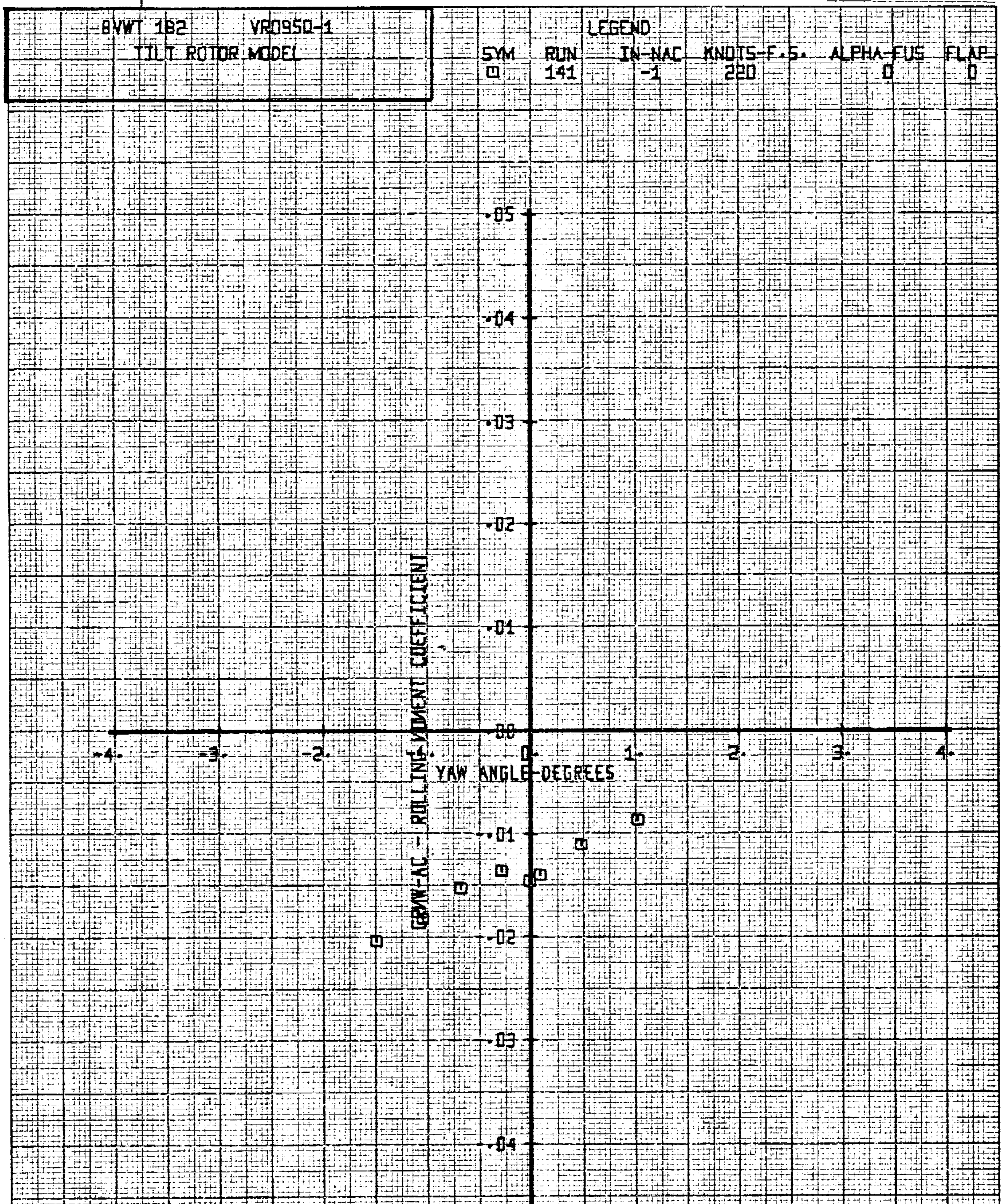


Figure 15-042. Aircraft Rolling Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

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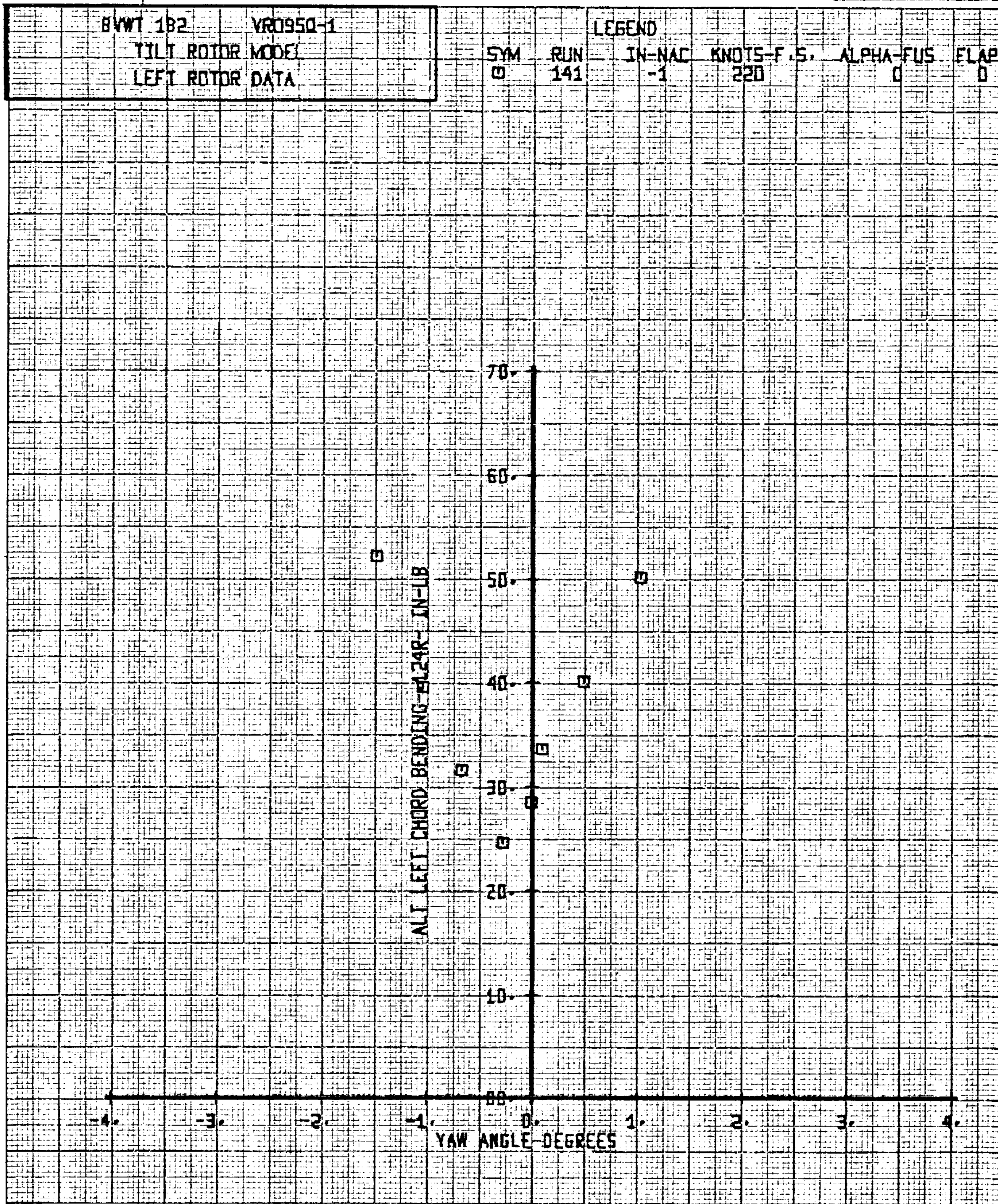

Figure 15-043. Alt. Left Chord Bending Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.

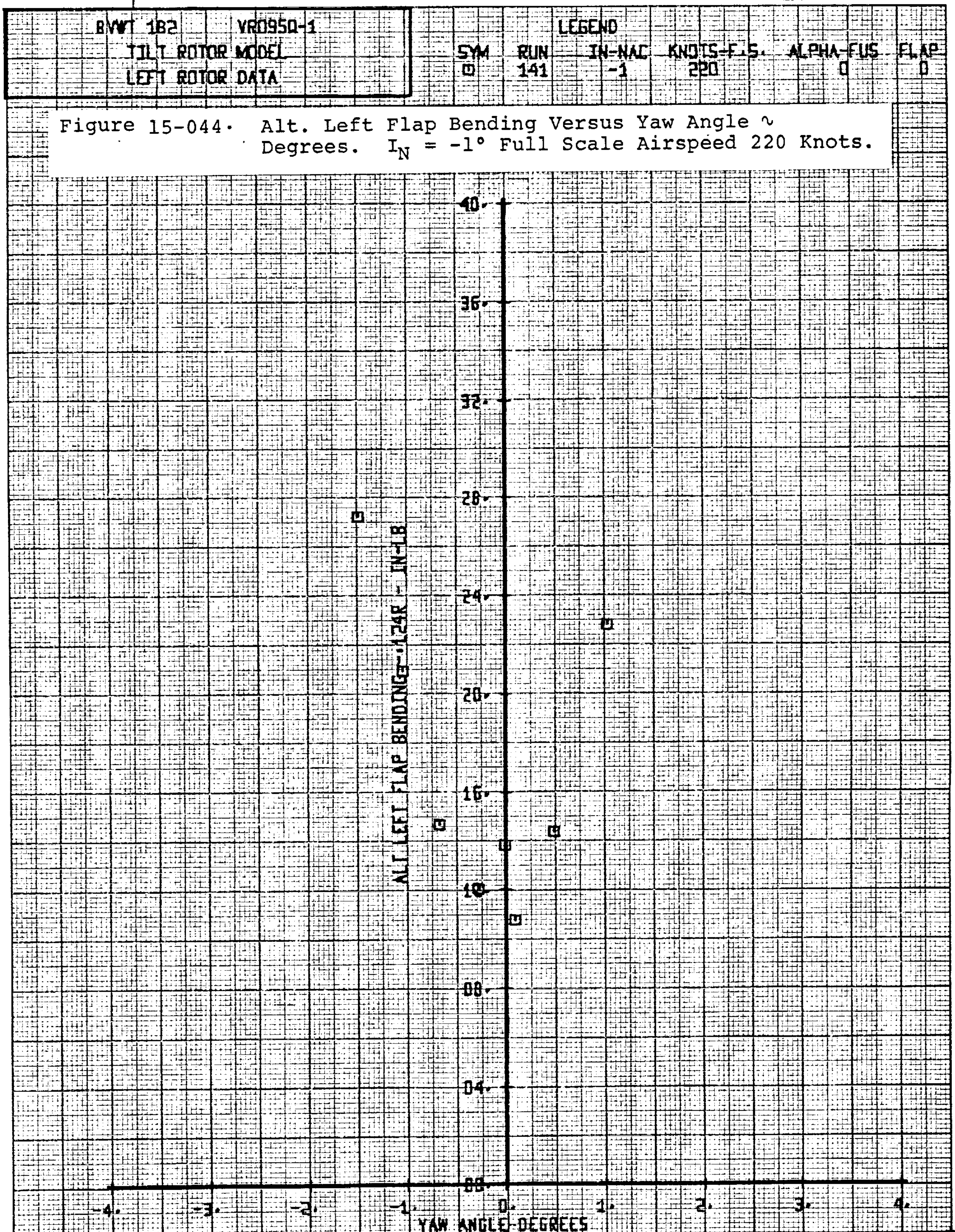

Figure 15-044. Alt. Left Flap Bending Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.

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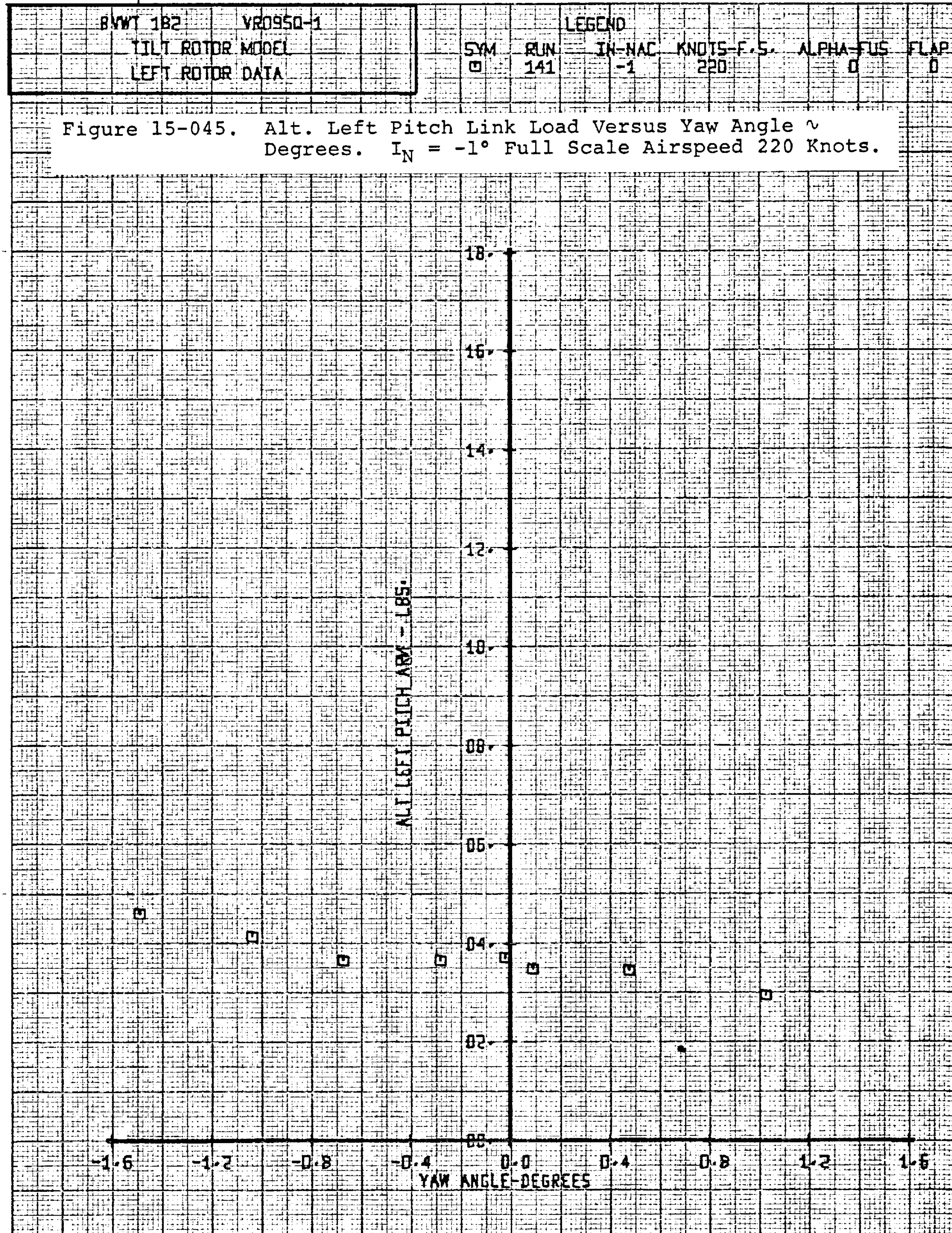
Figure 15-045. Alt. Left Pitch Link Load Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.



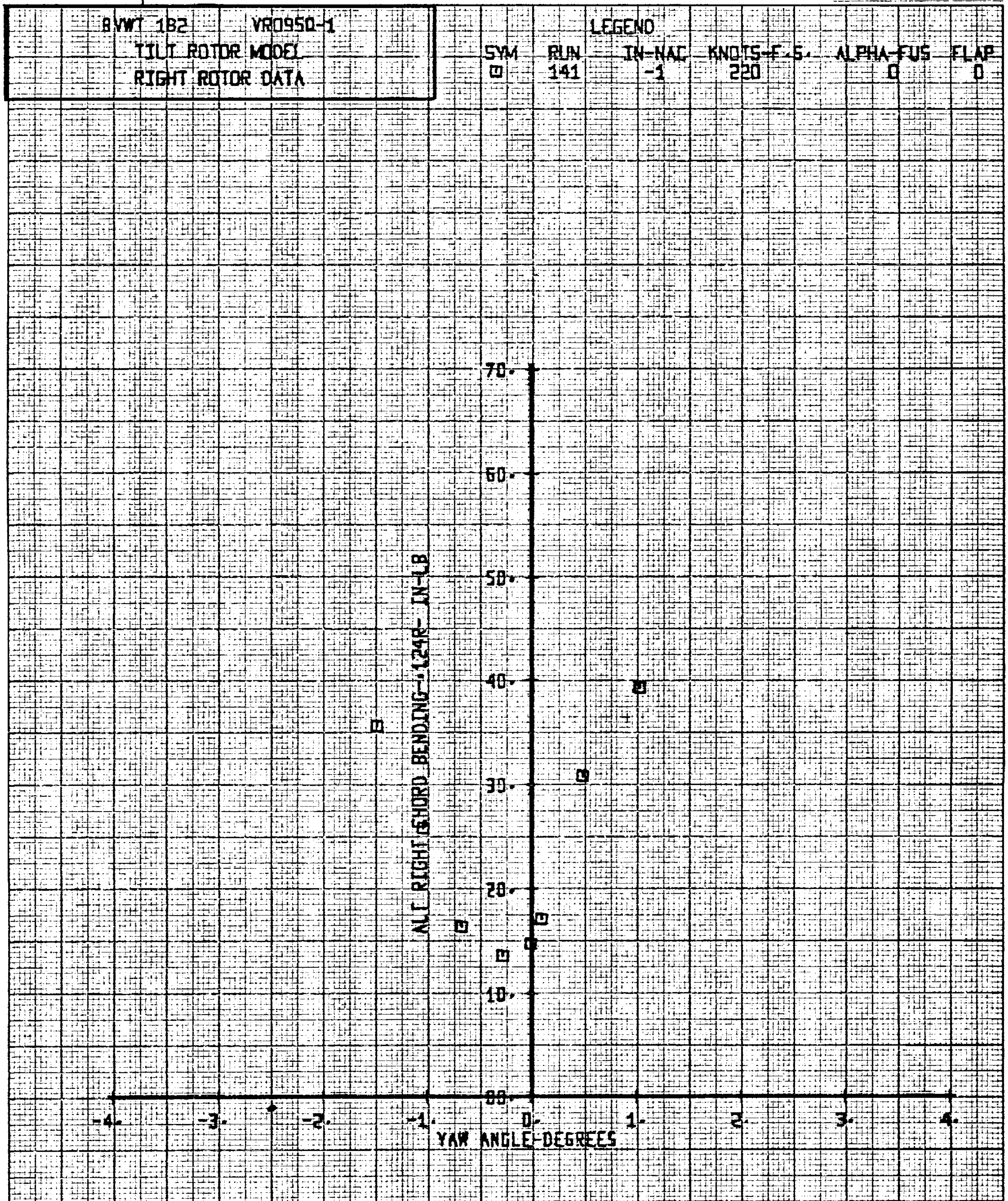


Figure 15-046. Alt. Right Chord Bending Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

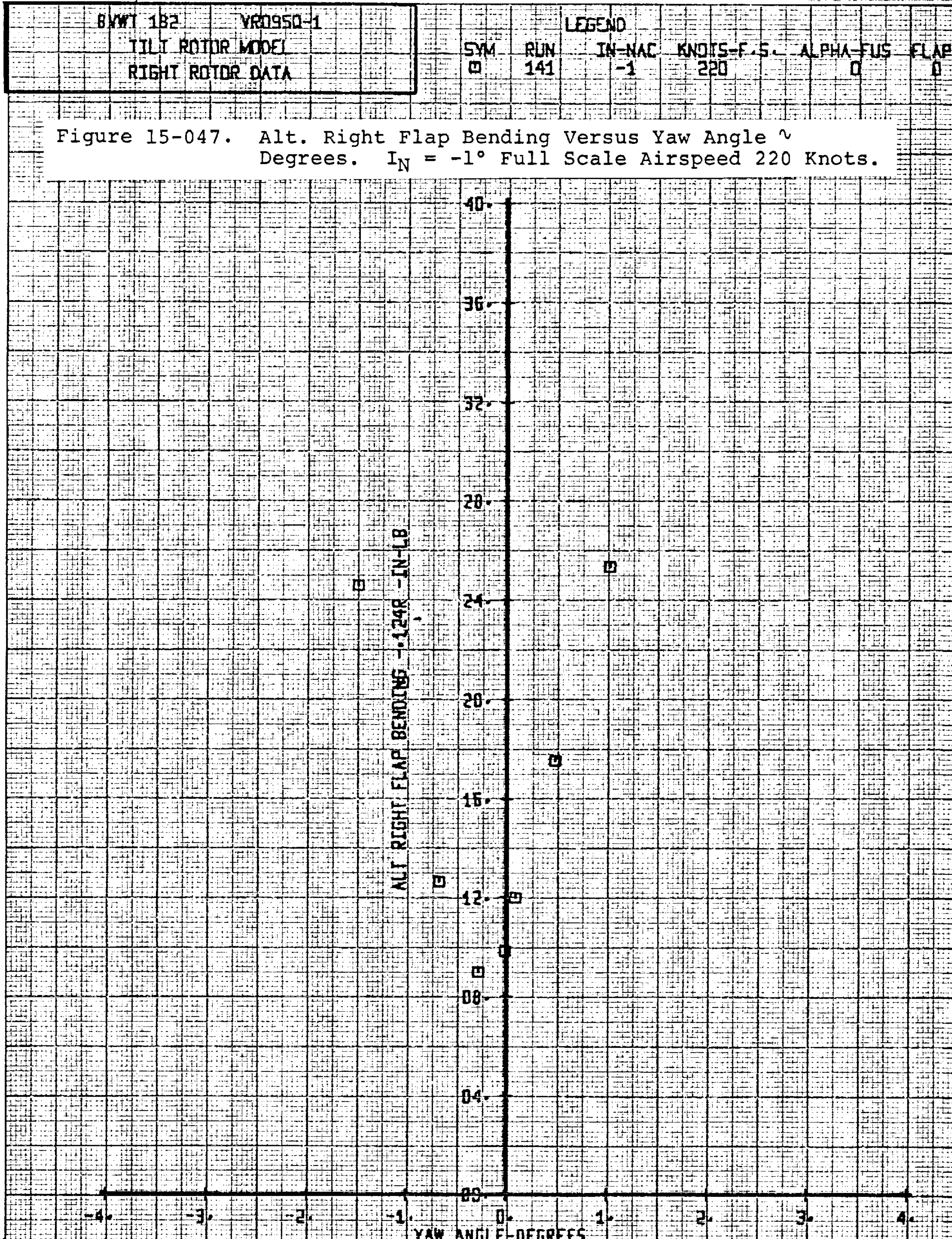


Figure 15-047. Alt. Right Flap Bending Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.

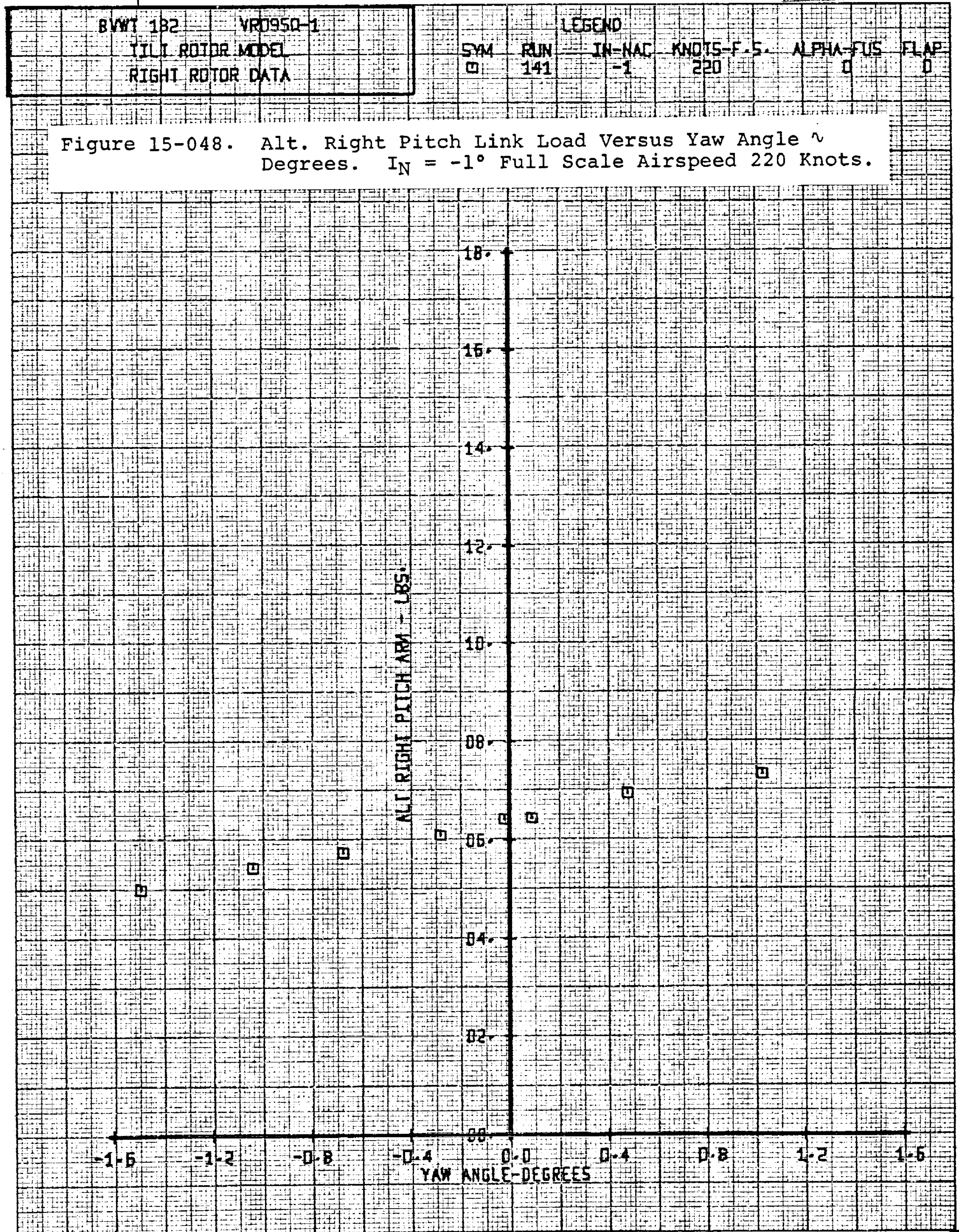


Figure 15-048. Alt. Right Pitch Link Load Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

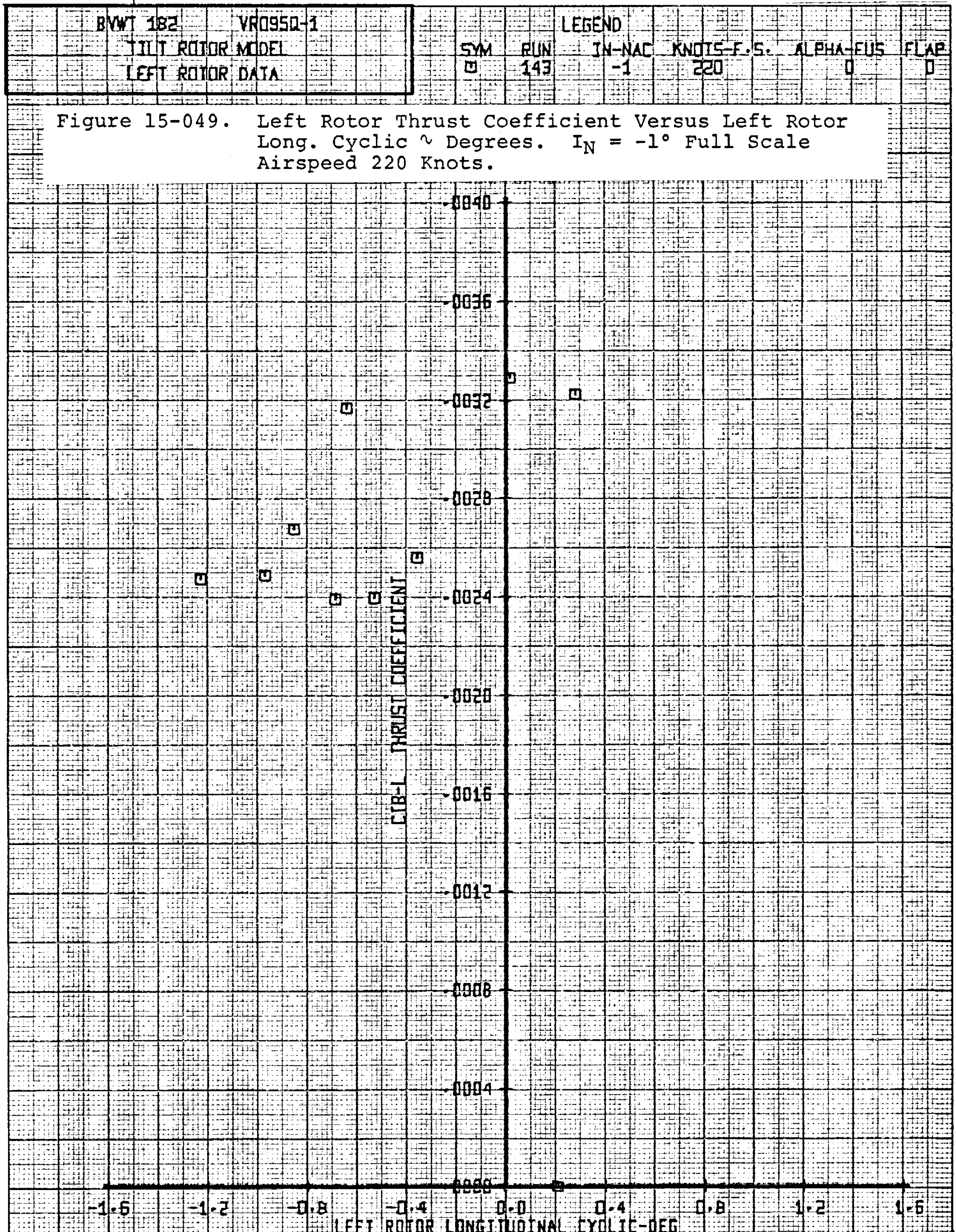
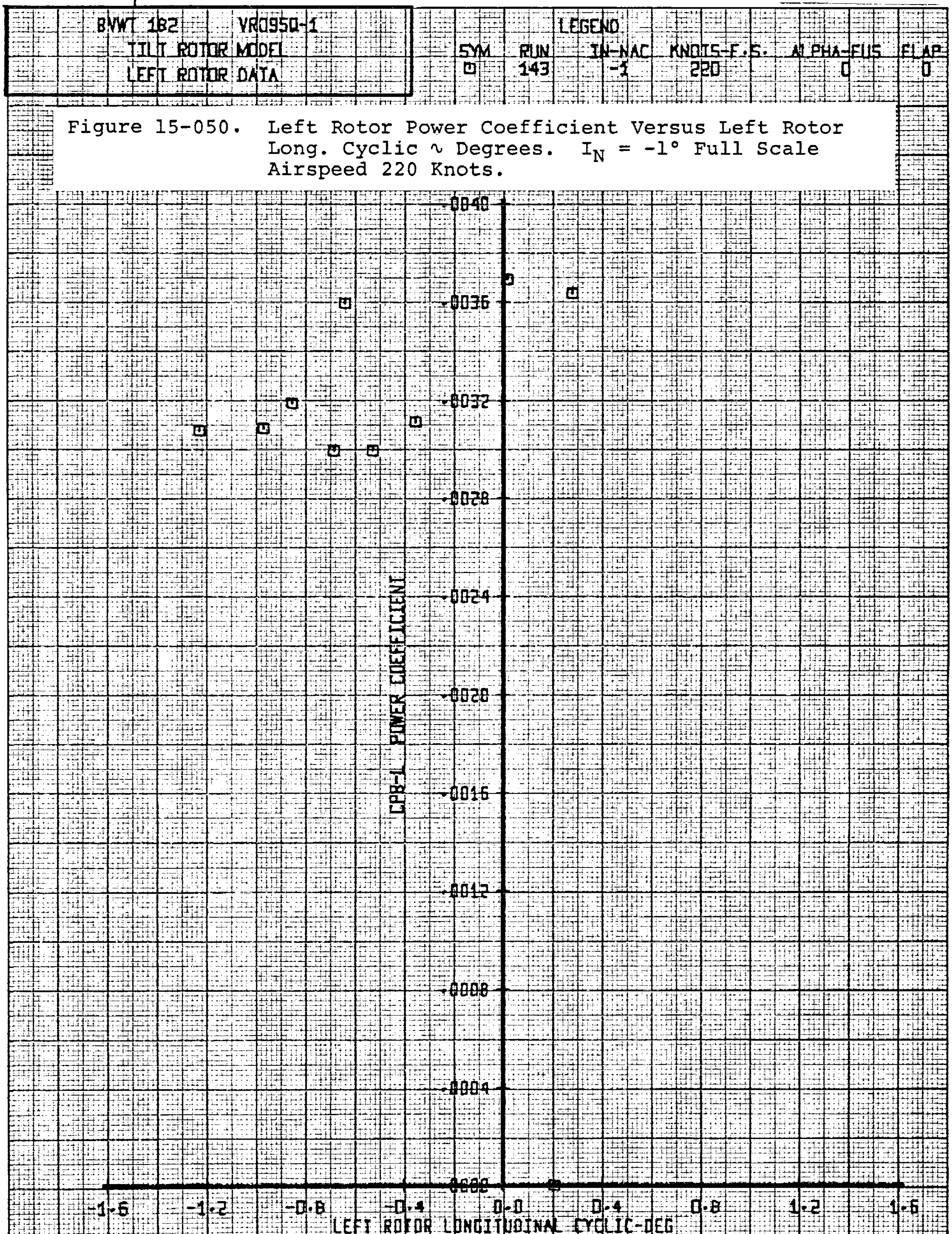


Figure 15-049. Left Rotor Thrust Coefficient Versus Left Rotor Long. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

Figure 15-050. Left Rotor Power Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.



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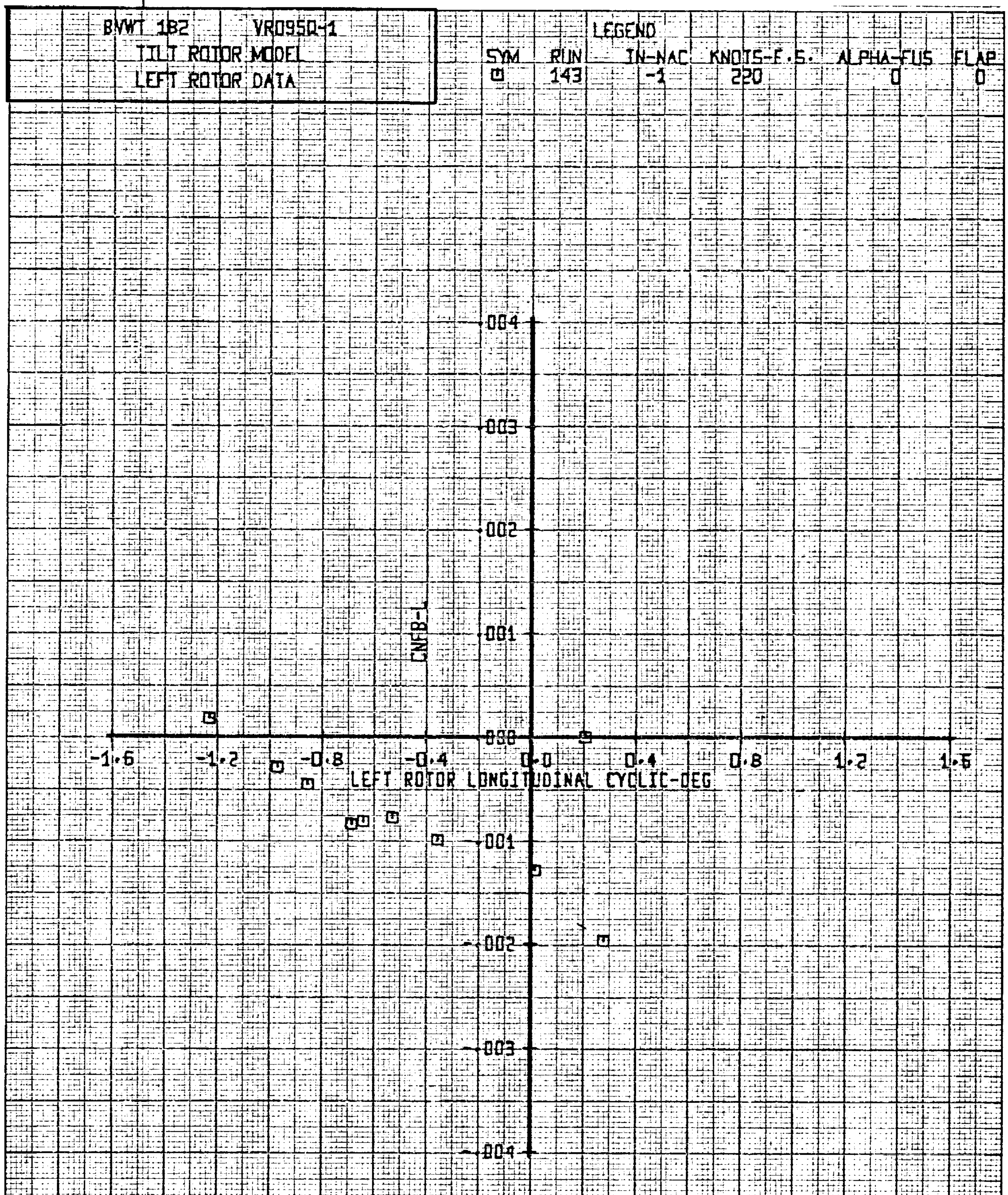

Figure 15-051. Left Rotor Normal Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

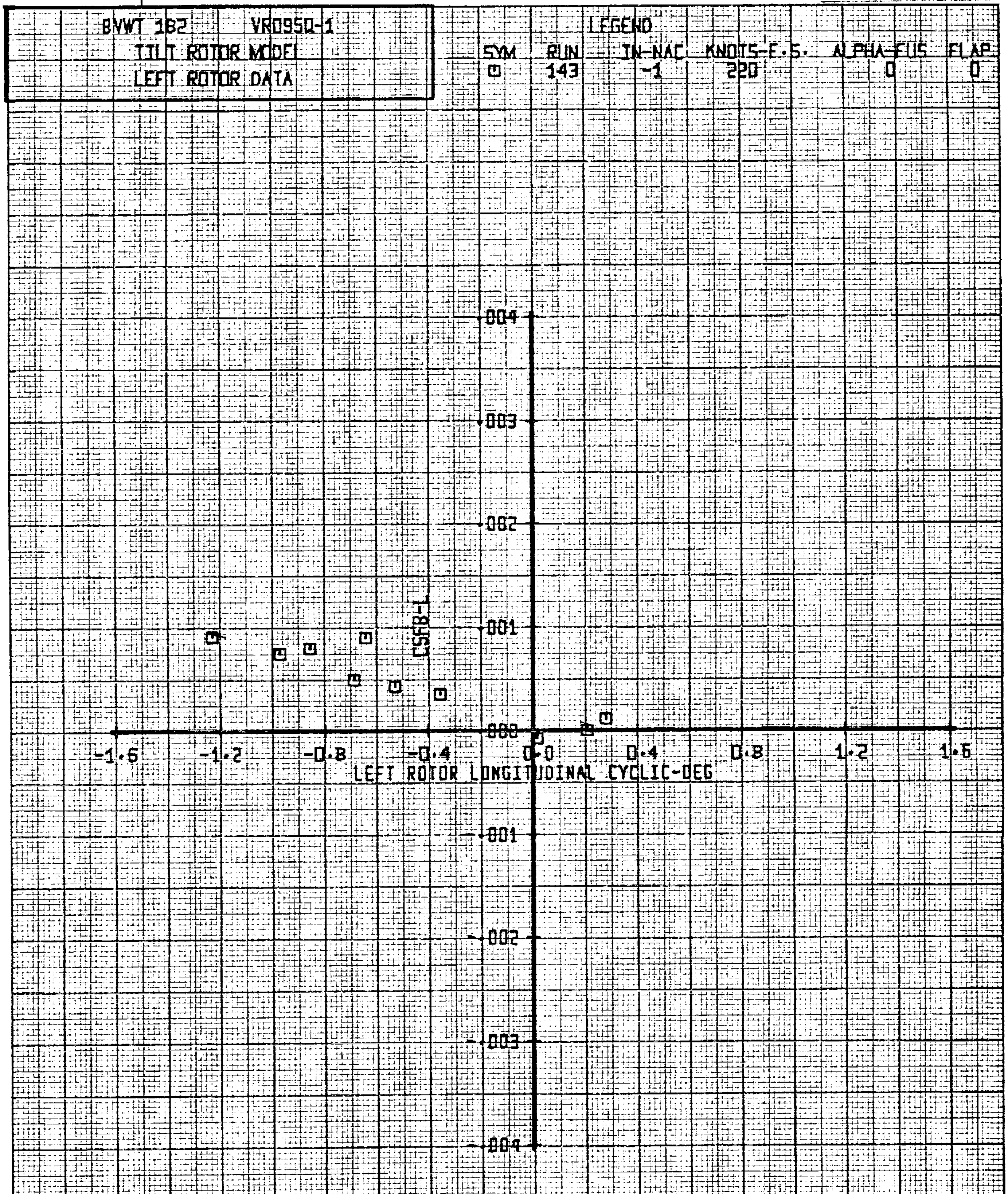

Figure 15-052. Left Rotor Side Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

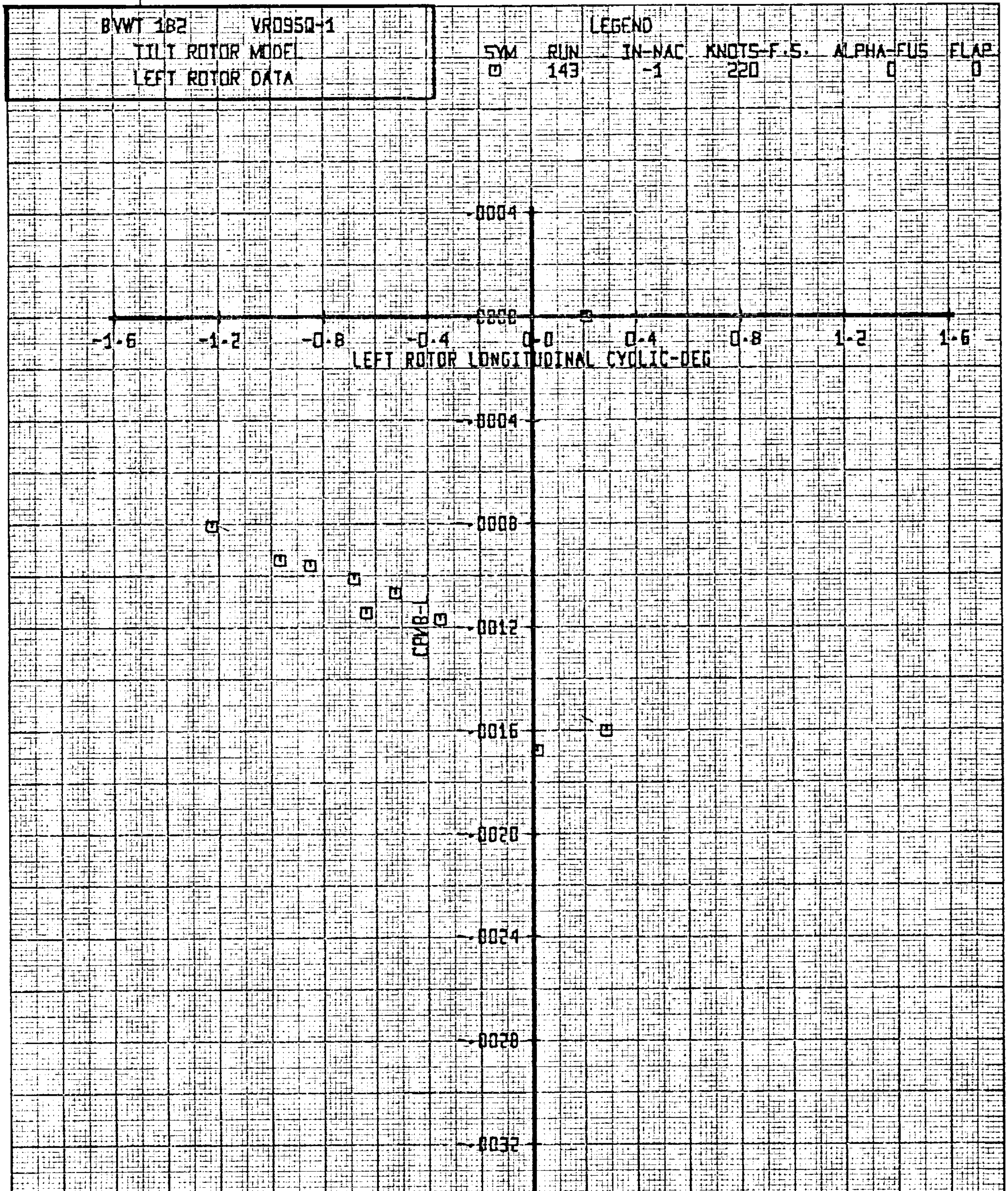

Figure 15-053. Left Rotor Pitching Moment Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

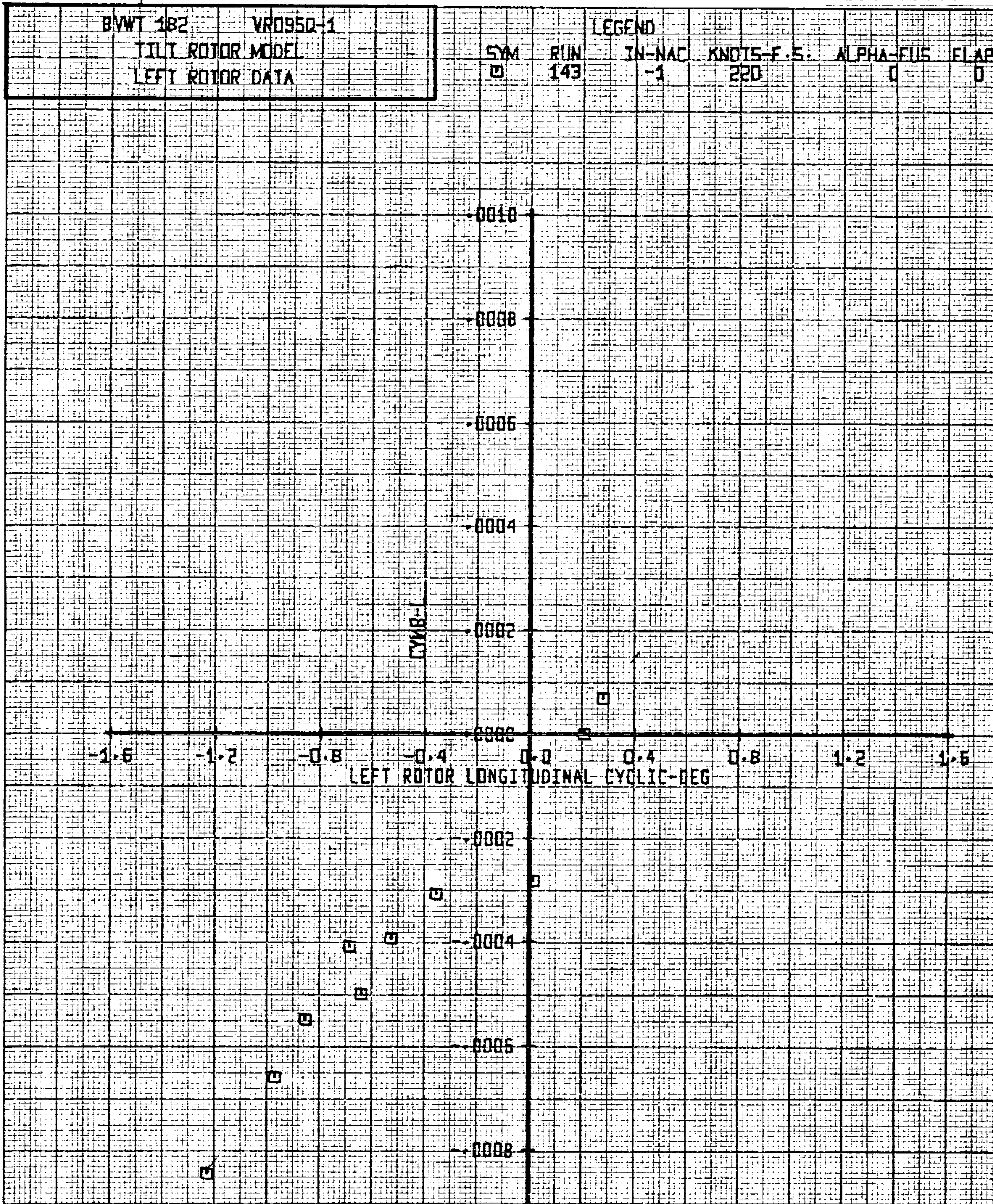

Figure 15-054. Left Rotor Yawing Moment Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

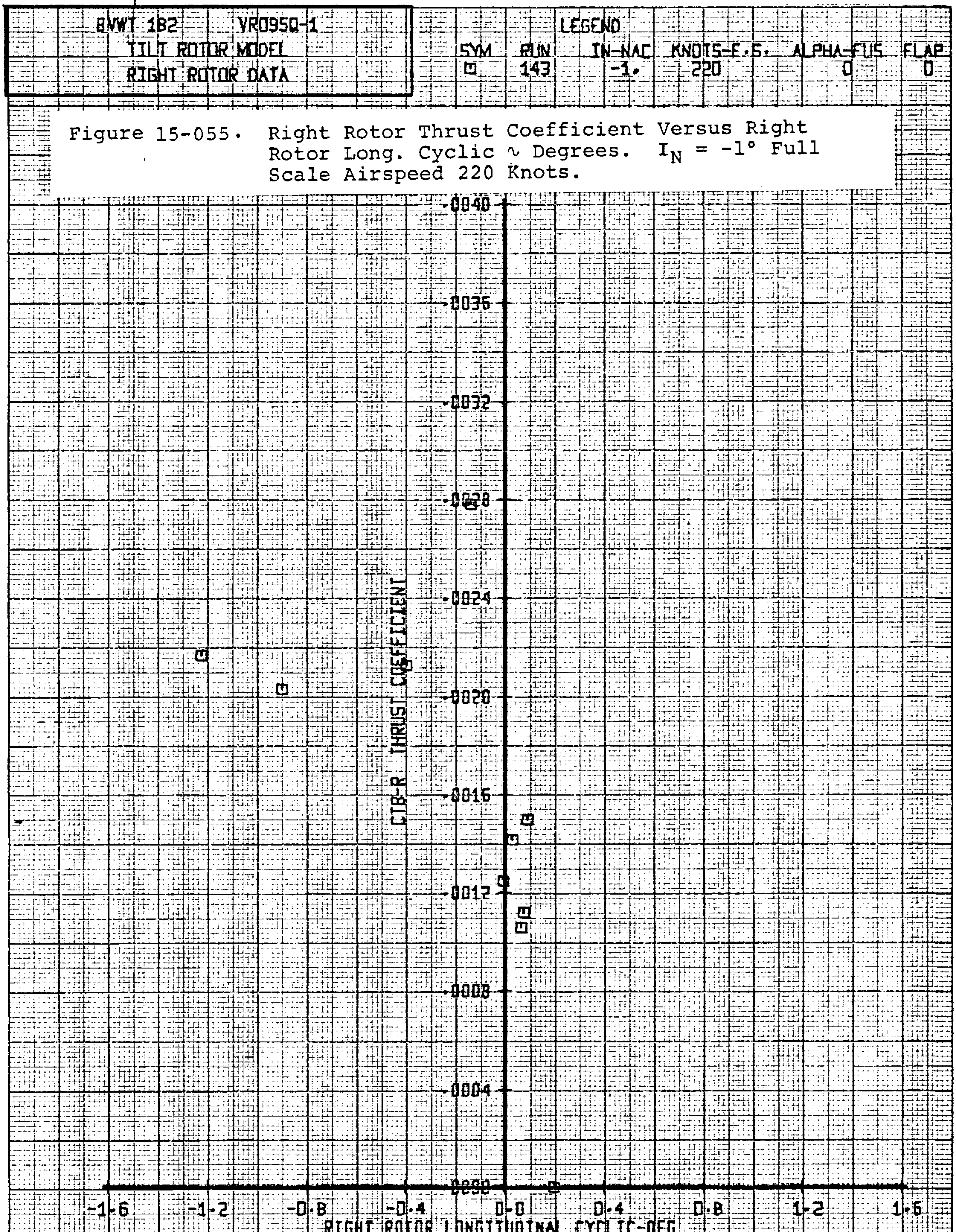

Figure 15-055. Right Rotor Thrust Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

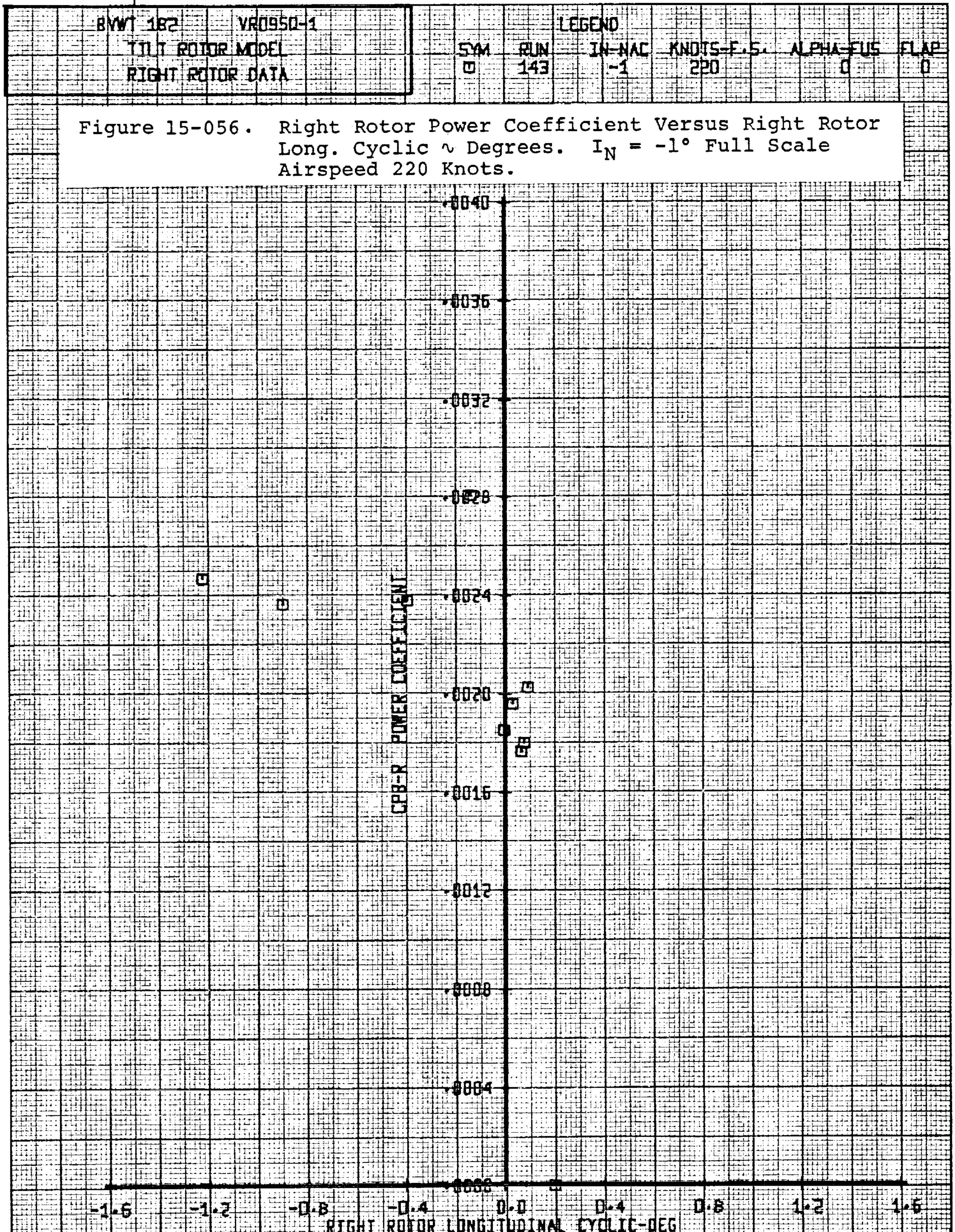

Figure 15-056. Right Rotor Power Coefficient Versus Right Rotor Long. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

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BVWT 182

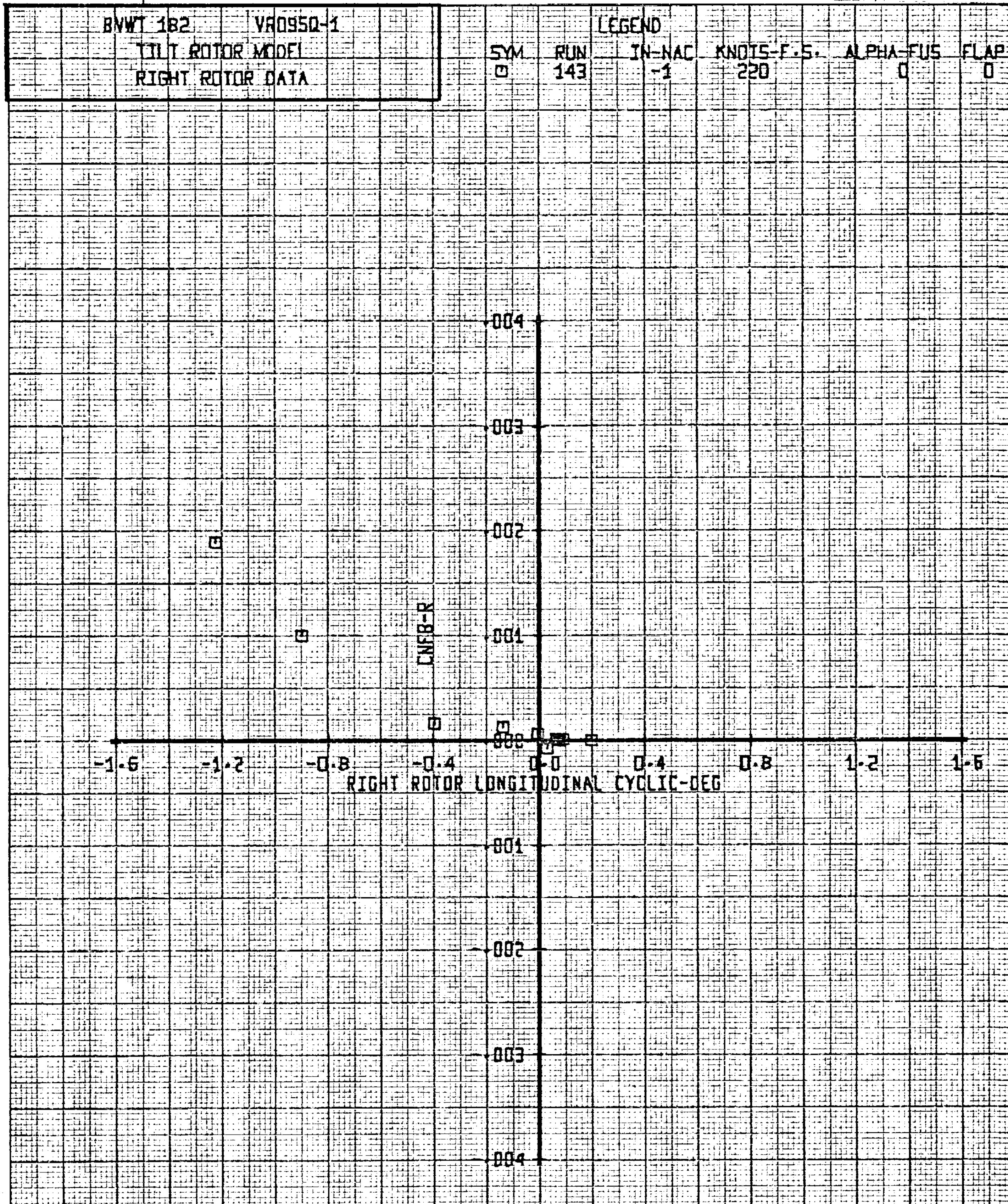

Figure 15-057. Right Rotor Normal Force Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.

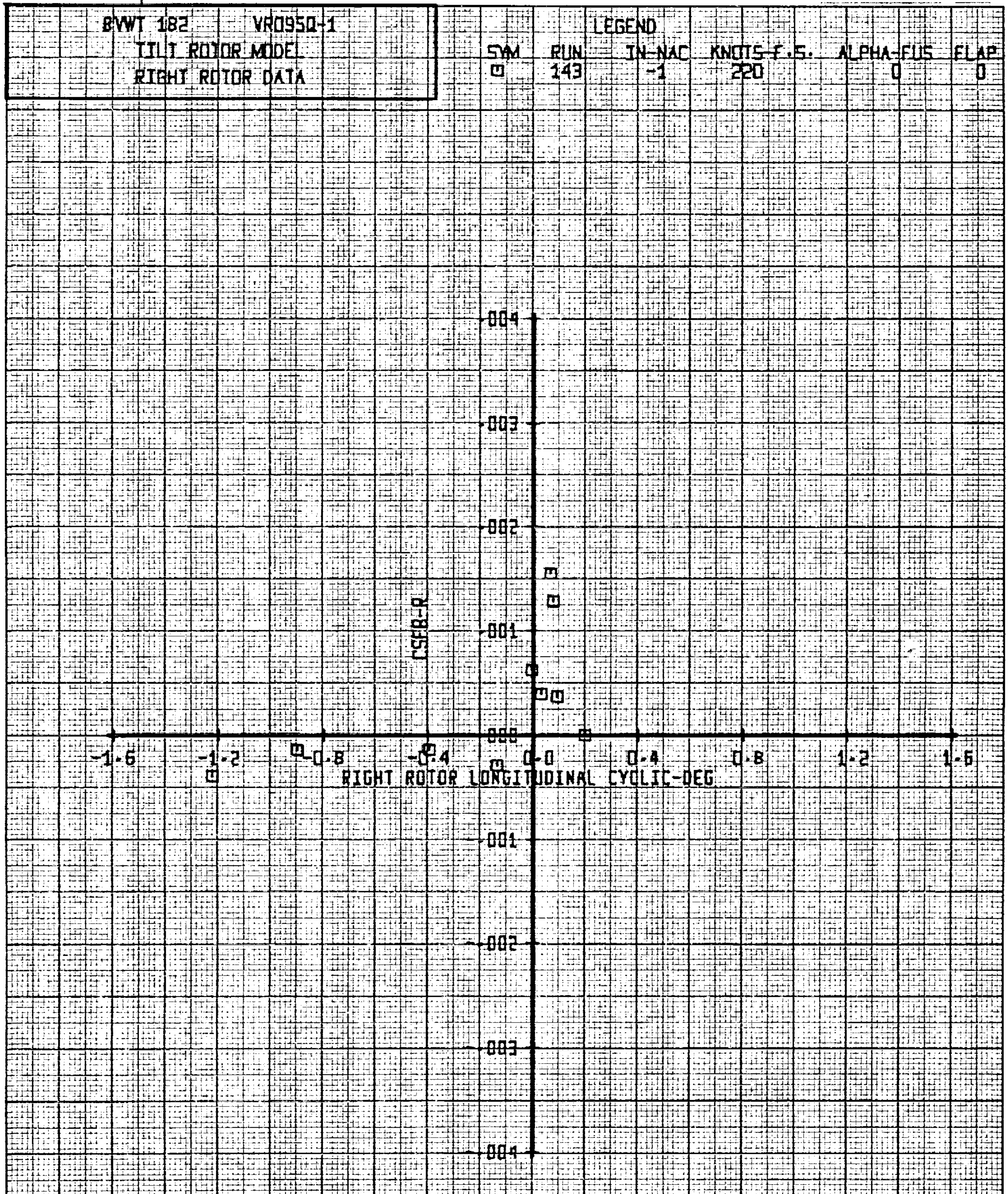

Figure 15-058. Right Rotor Side Force Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

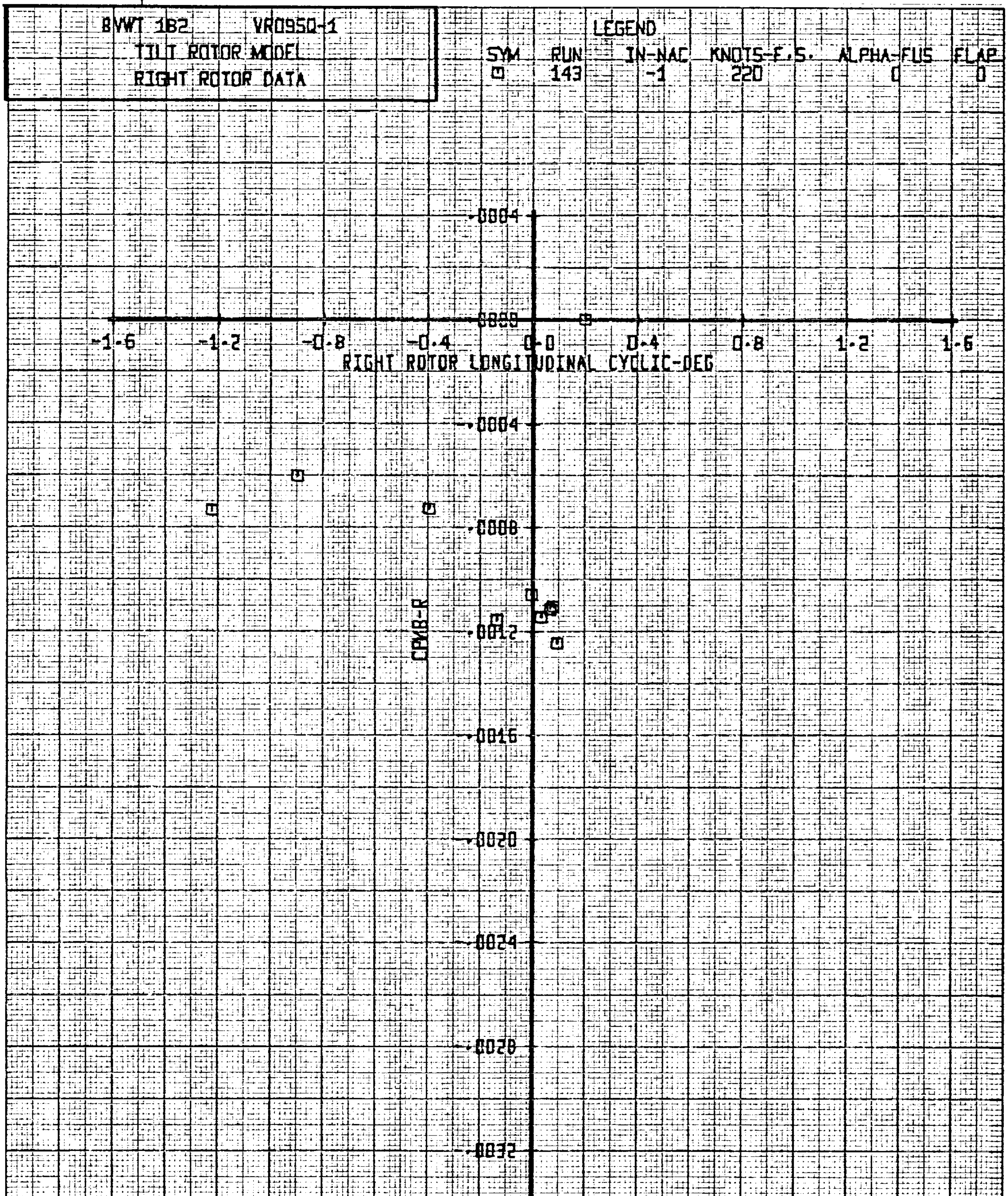

Figure 15-059. Right Rotor Pitching Moment Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

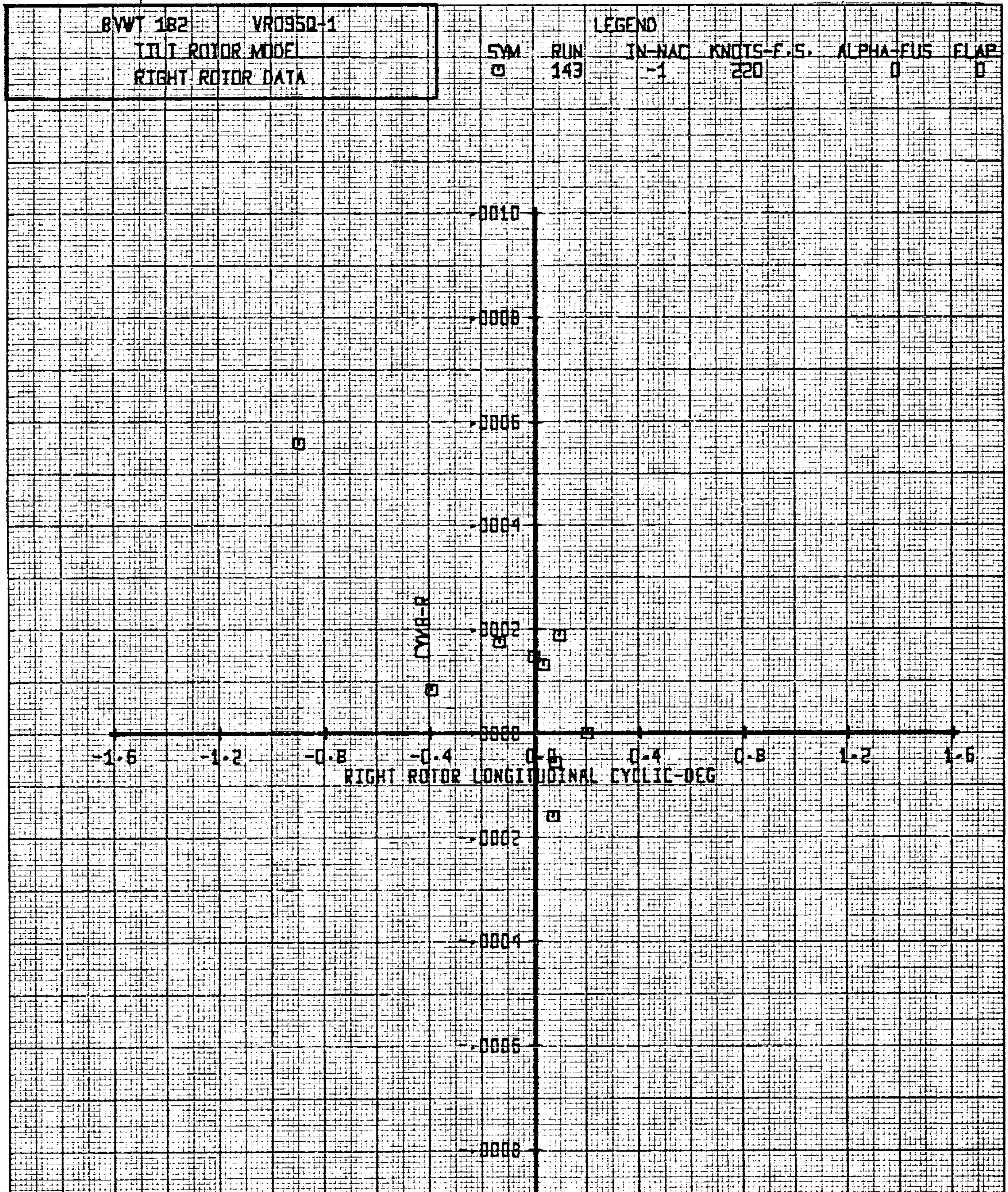

Figure 15-060. Right Rotor Yawing Moment Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

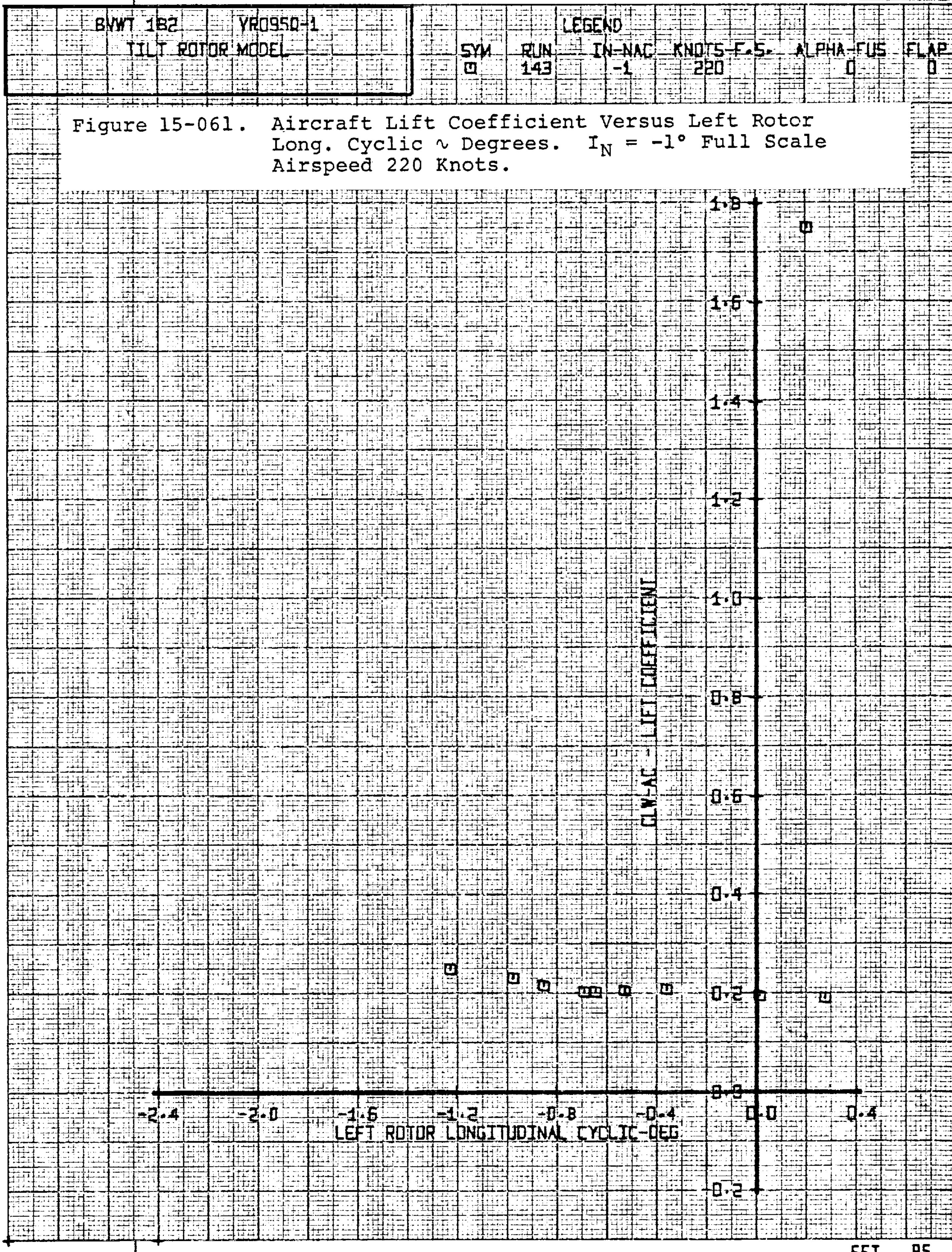

Figure 15-061. Aircraft Lift Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

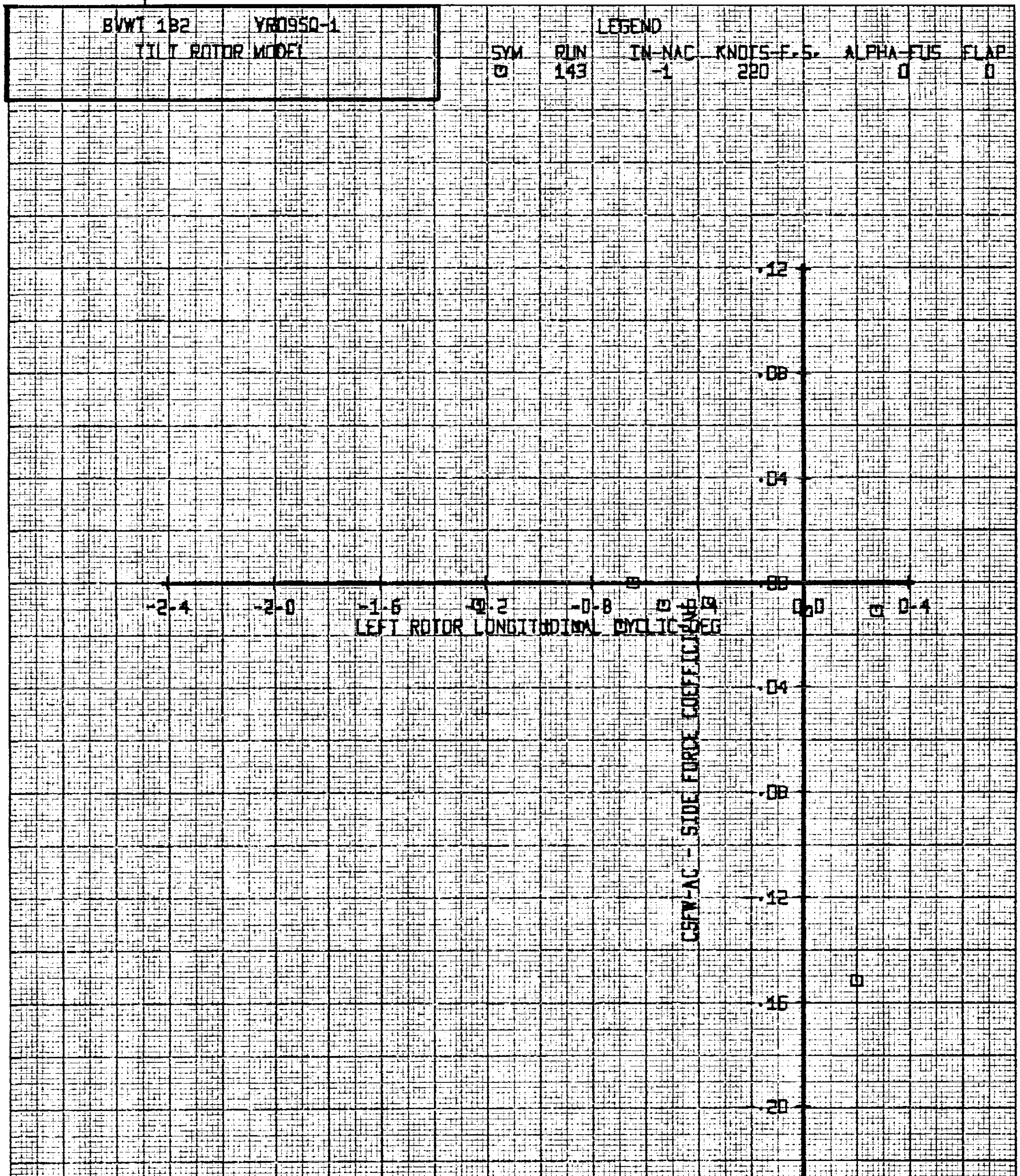

Figure 15-062. Aircraft Side Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

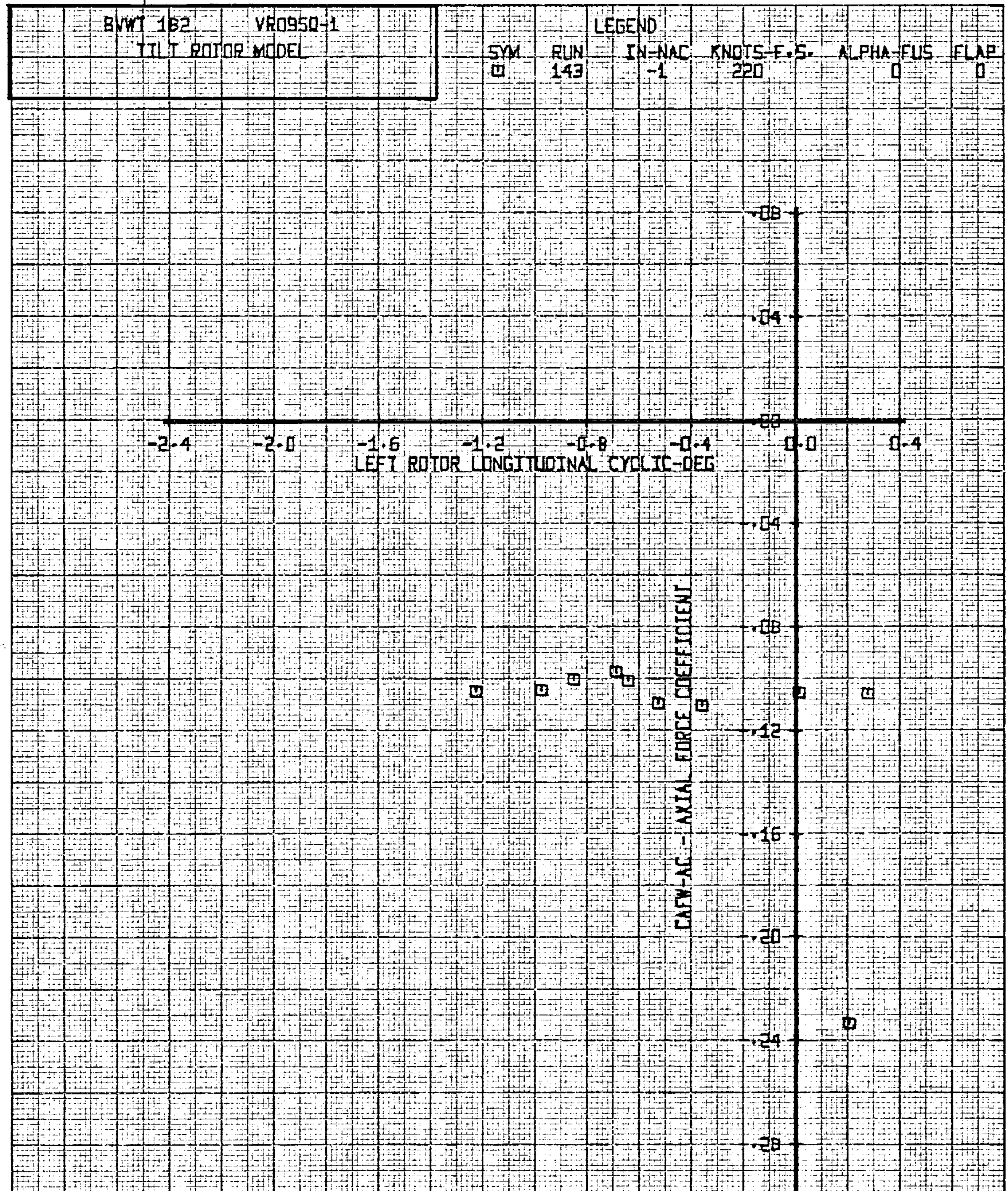

Figure 15-063. Aircraft Axial Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.

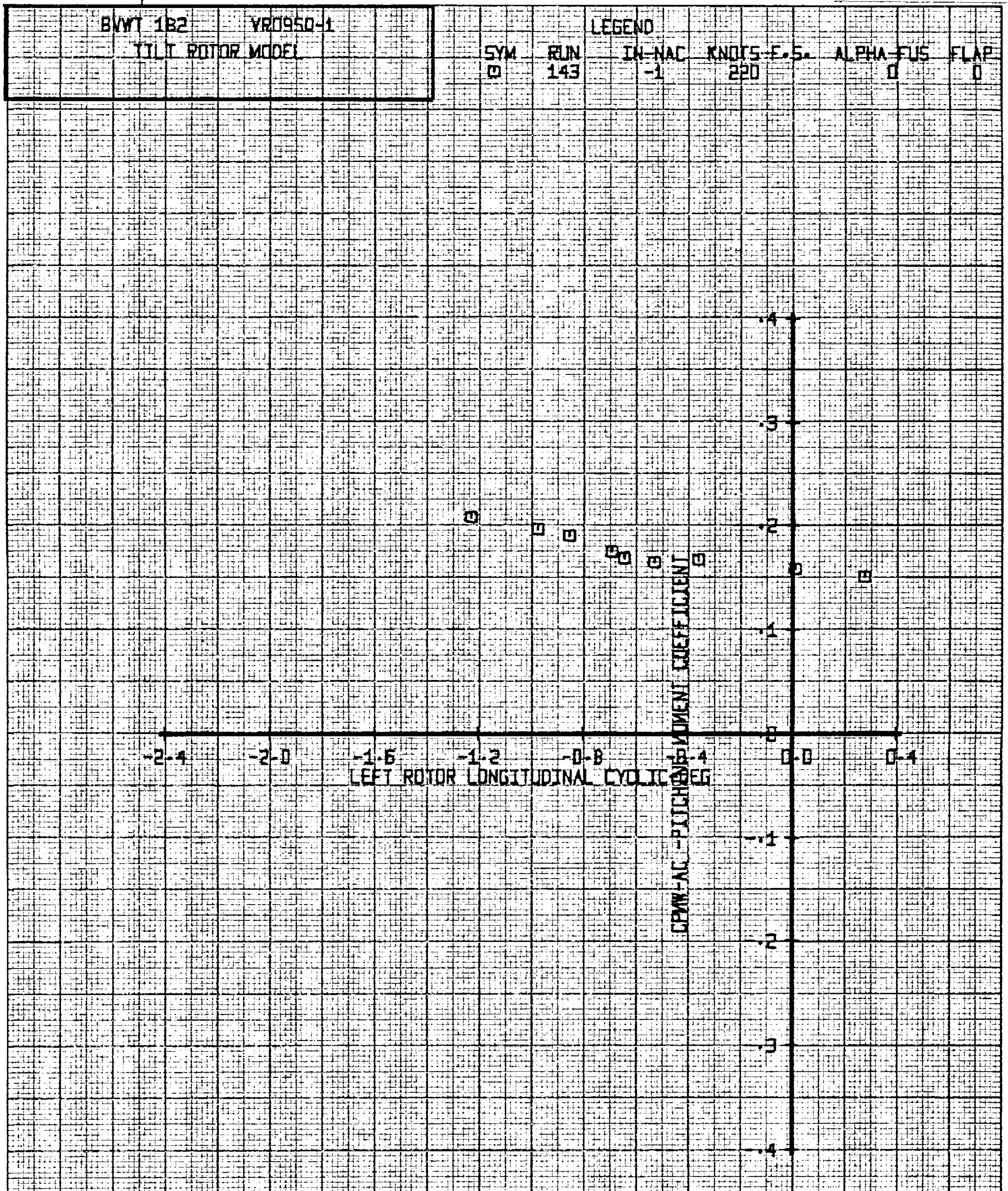

Figure 15-064. Aircraft Pitching Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

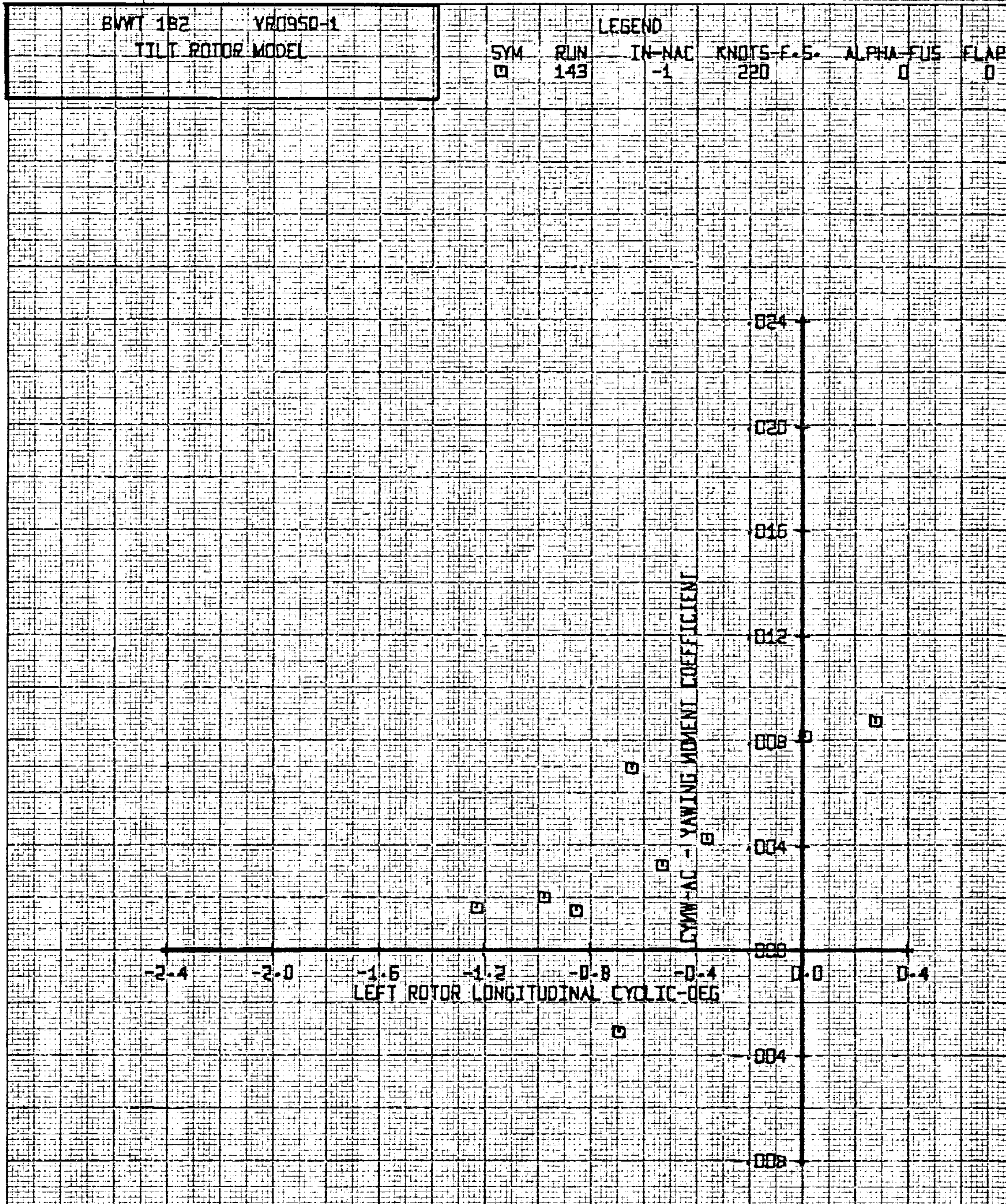

Figure 15-065. Aircraft Yawing Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

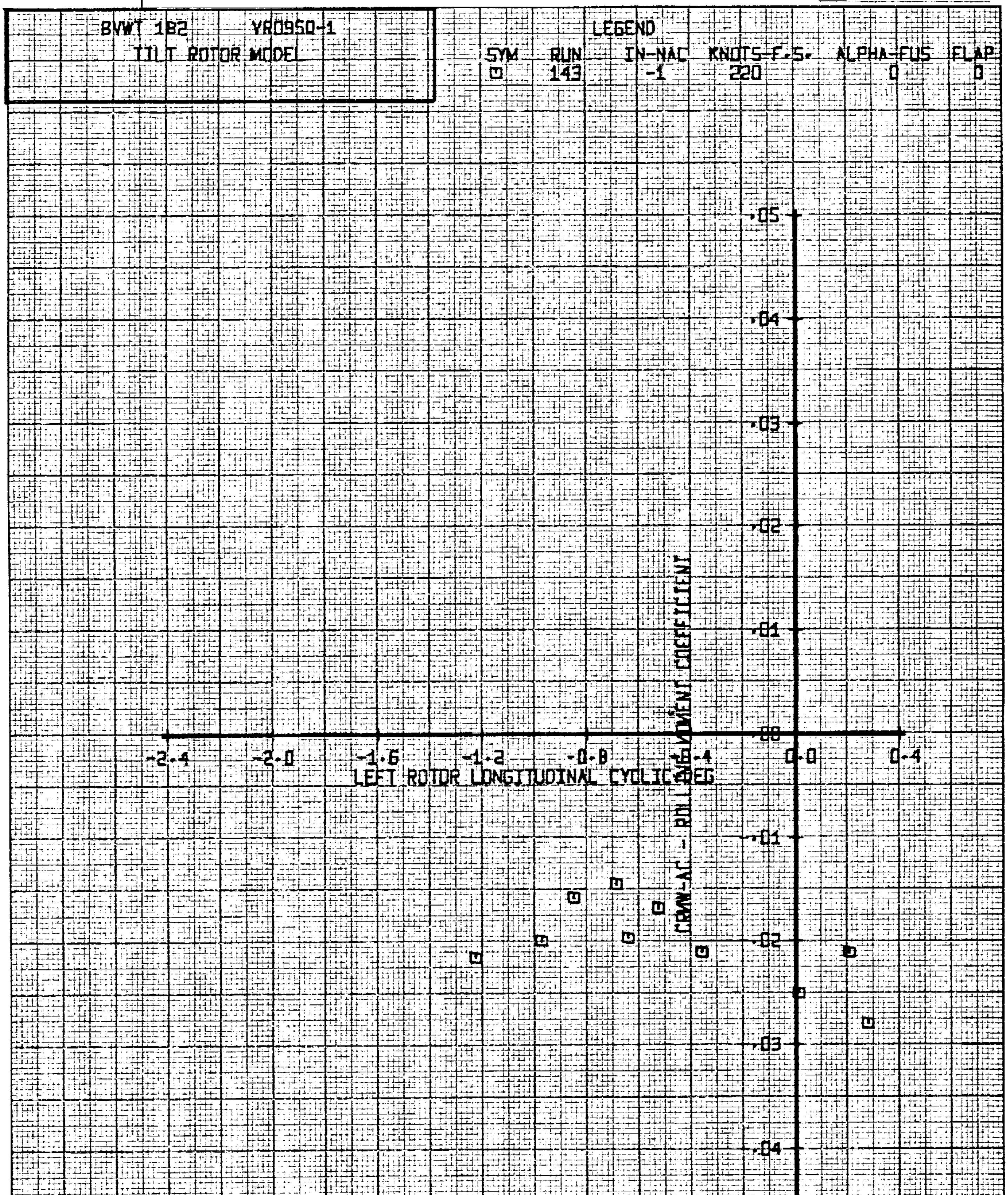

Figure 15-066. Aircraft Rolling Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

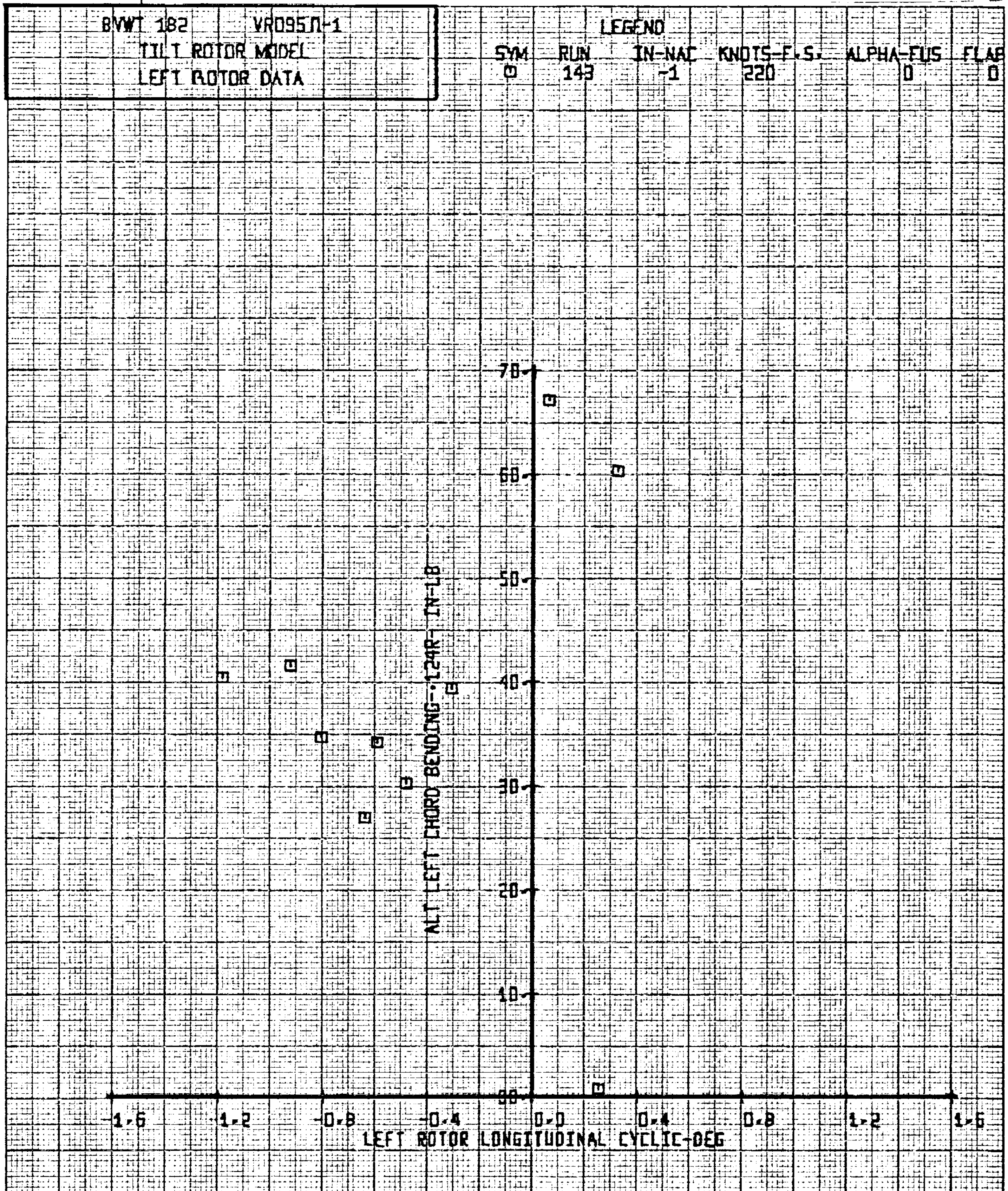

Figure 15-067. Alt. Left Chord Bending Versus Left Rotor Long. Cyclic ~ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.

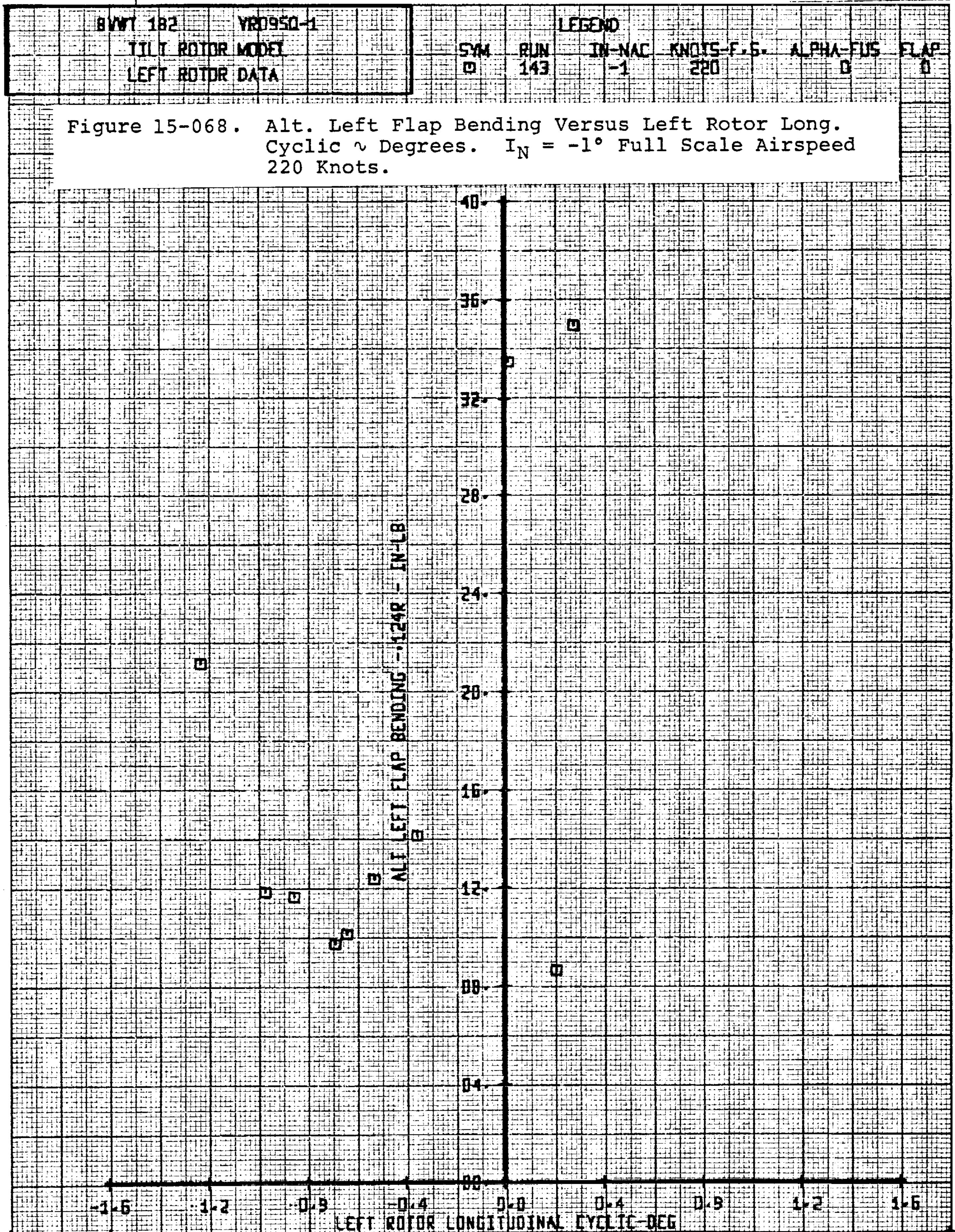

Figure 15-068. Alt. Left Flap Bending Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.

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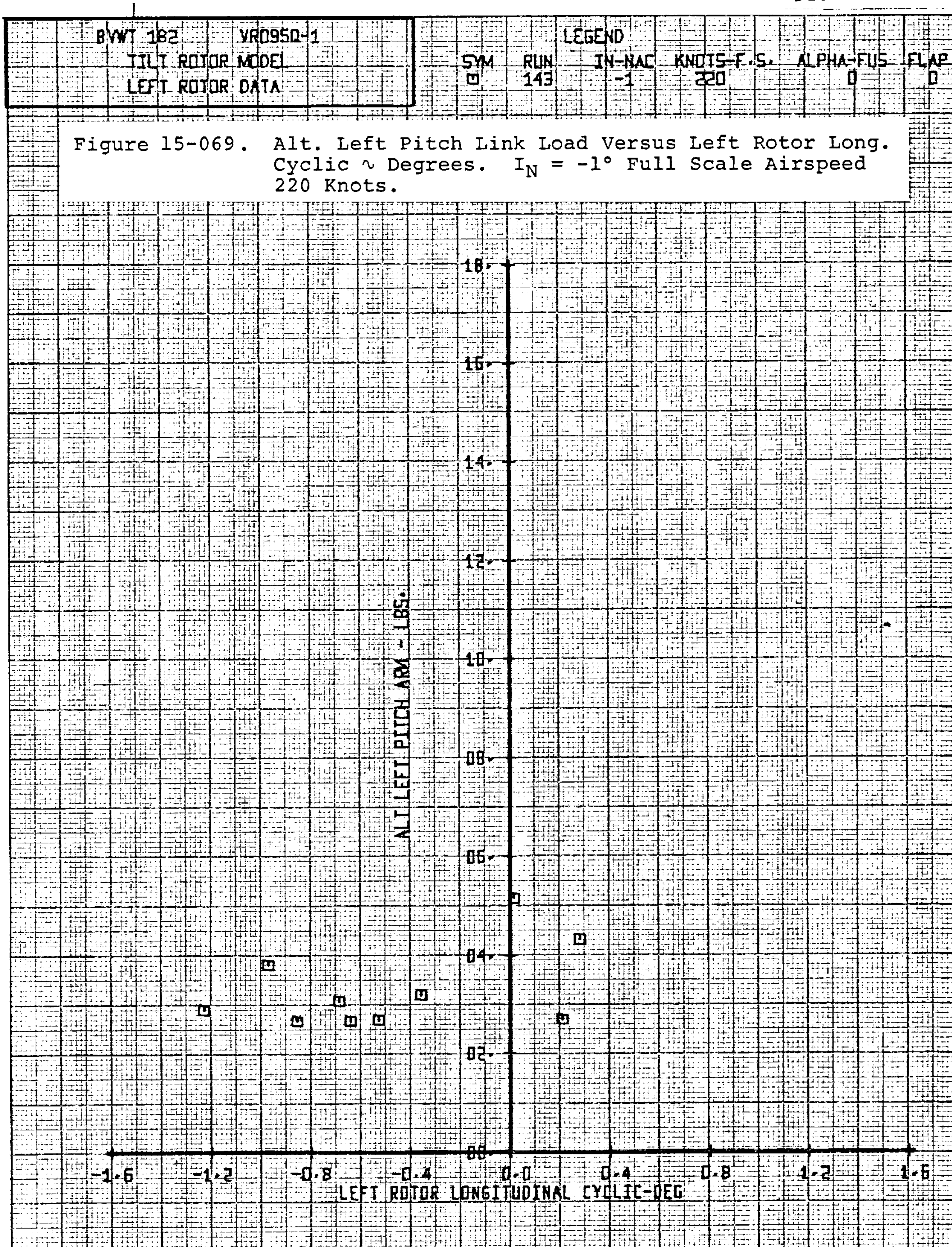

Figure 15-069. Alt. Left Pitch Link Load Versus Left Rotor Long. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

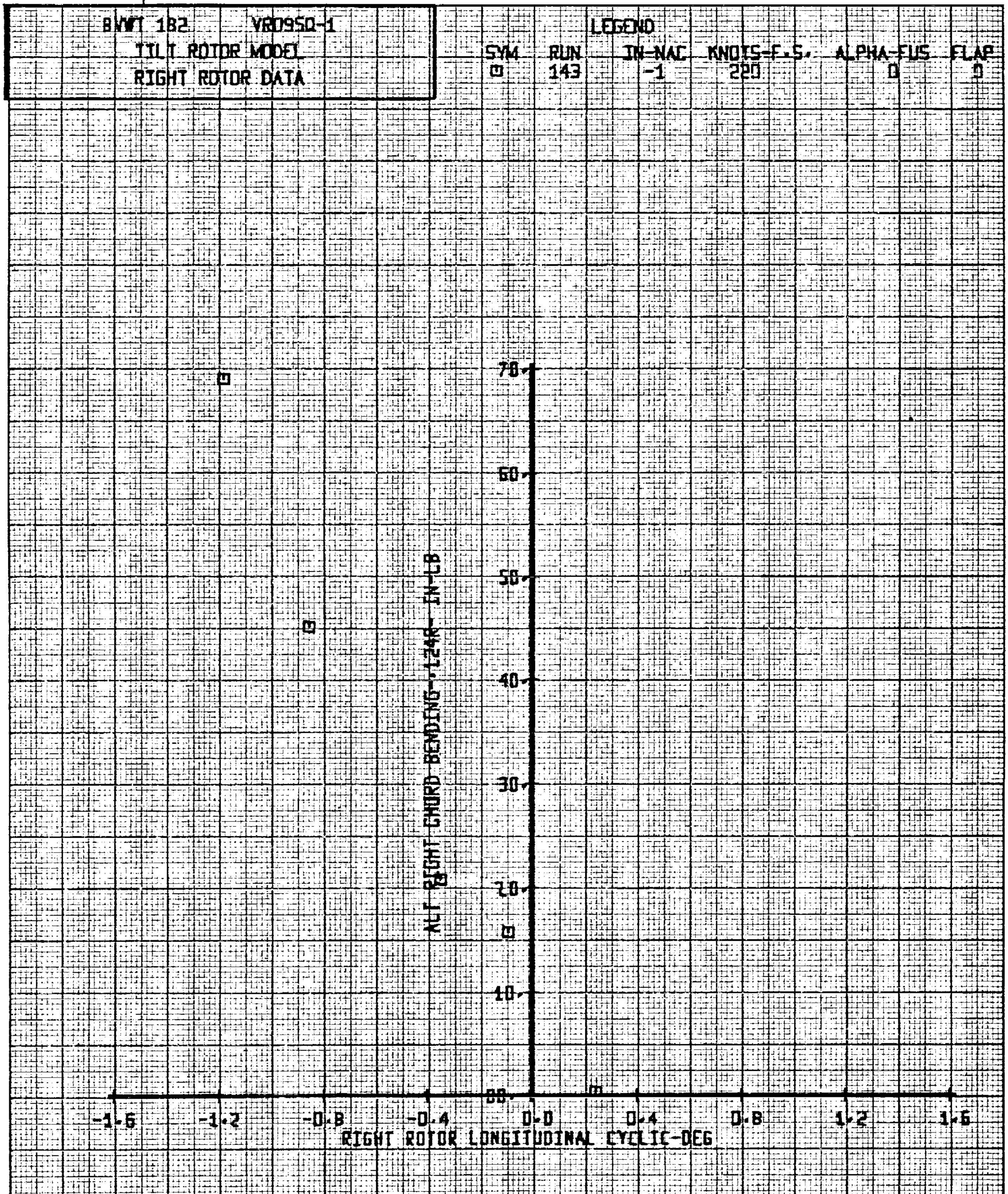

Figure 15-070. Alt. Right Chord Bending Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

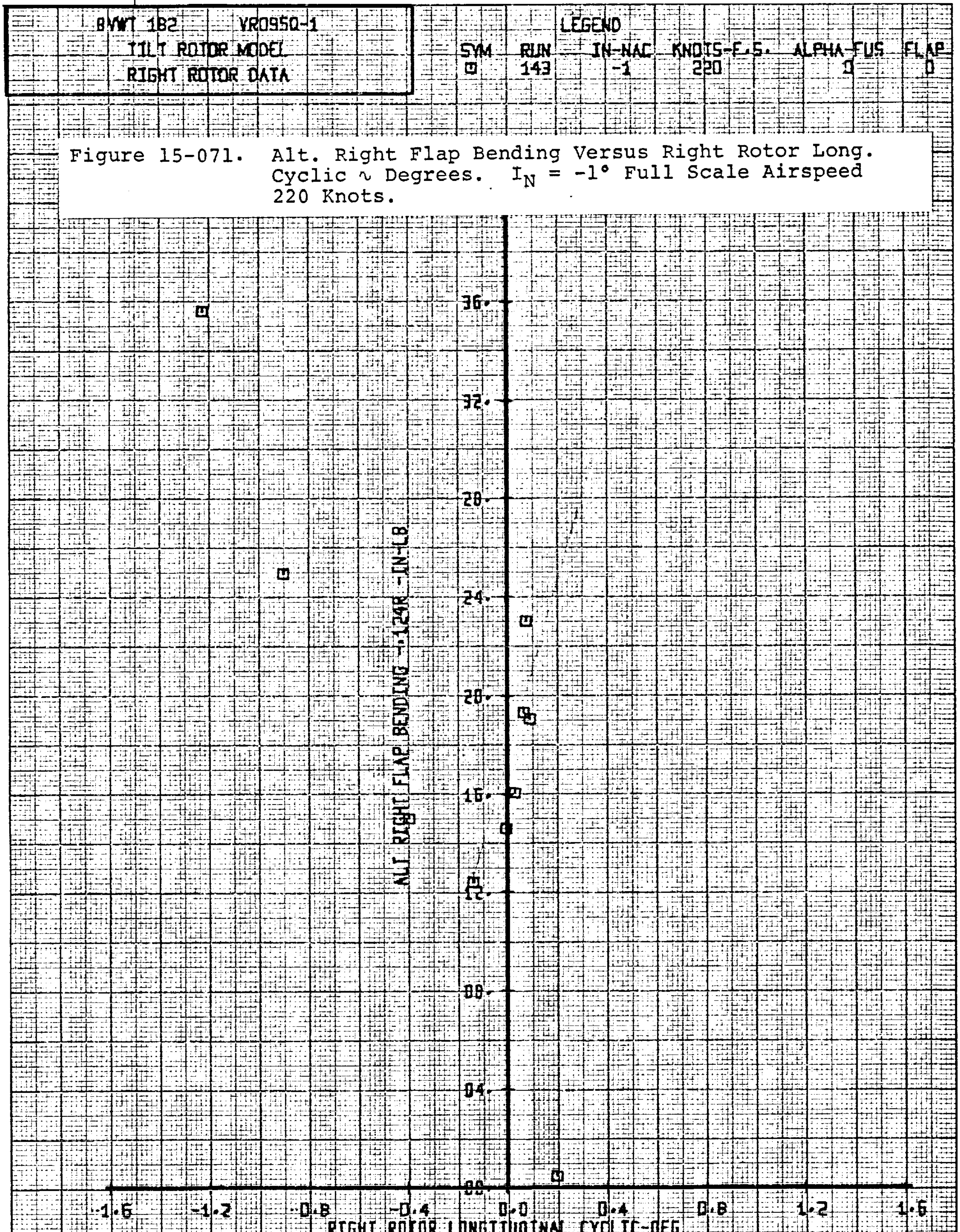

Figure 15-071. Alt. Right Flap Bending Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

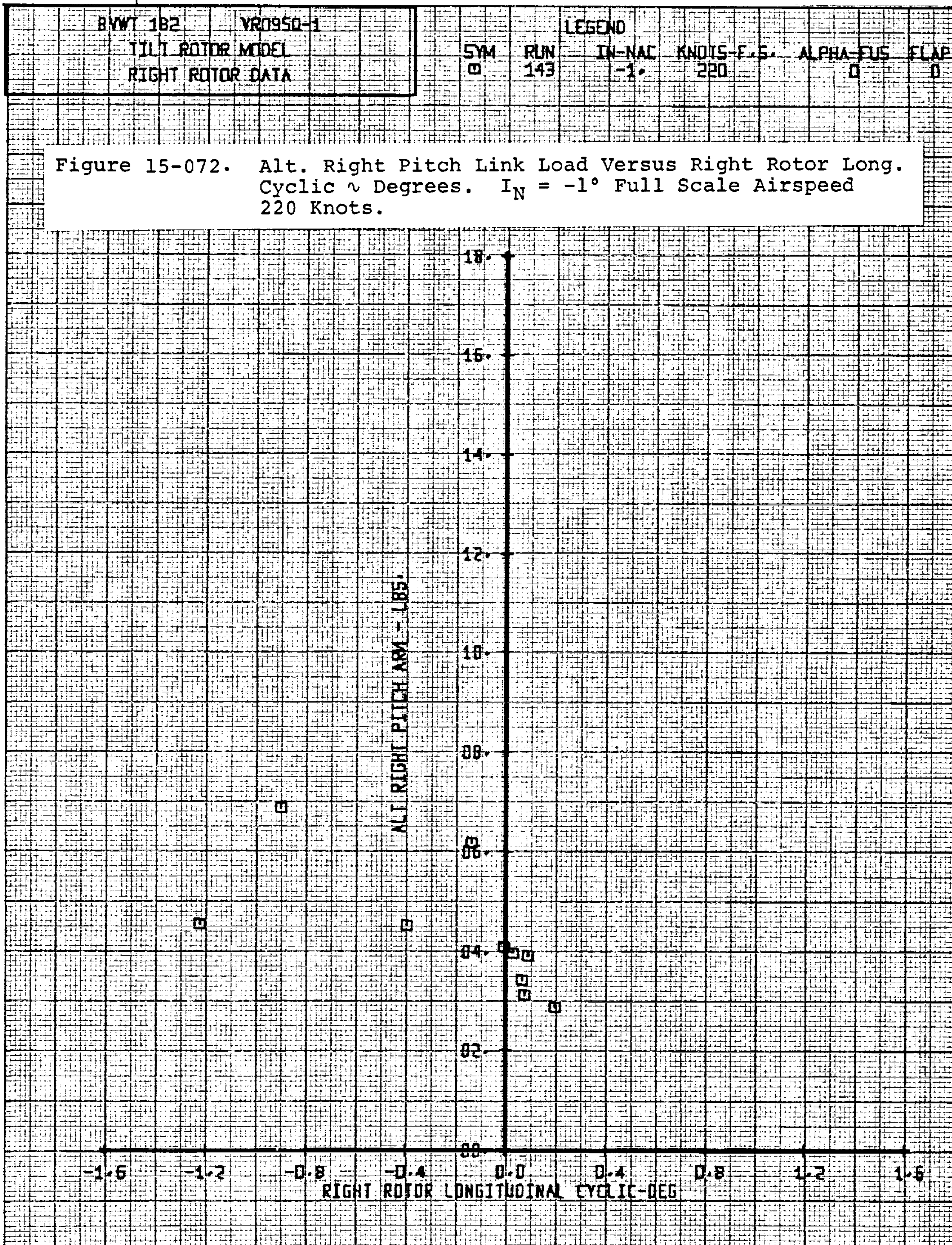

Figure 15-072. Alt. Right Pitch Link Load Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

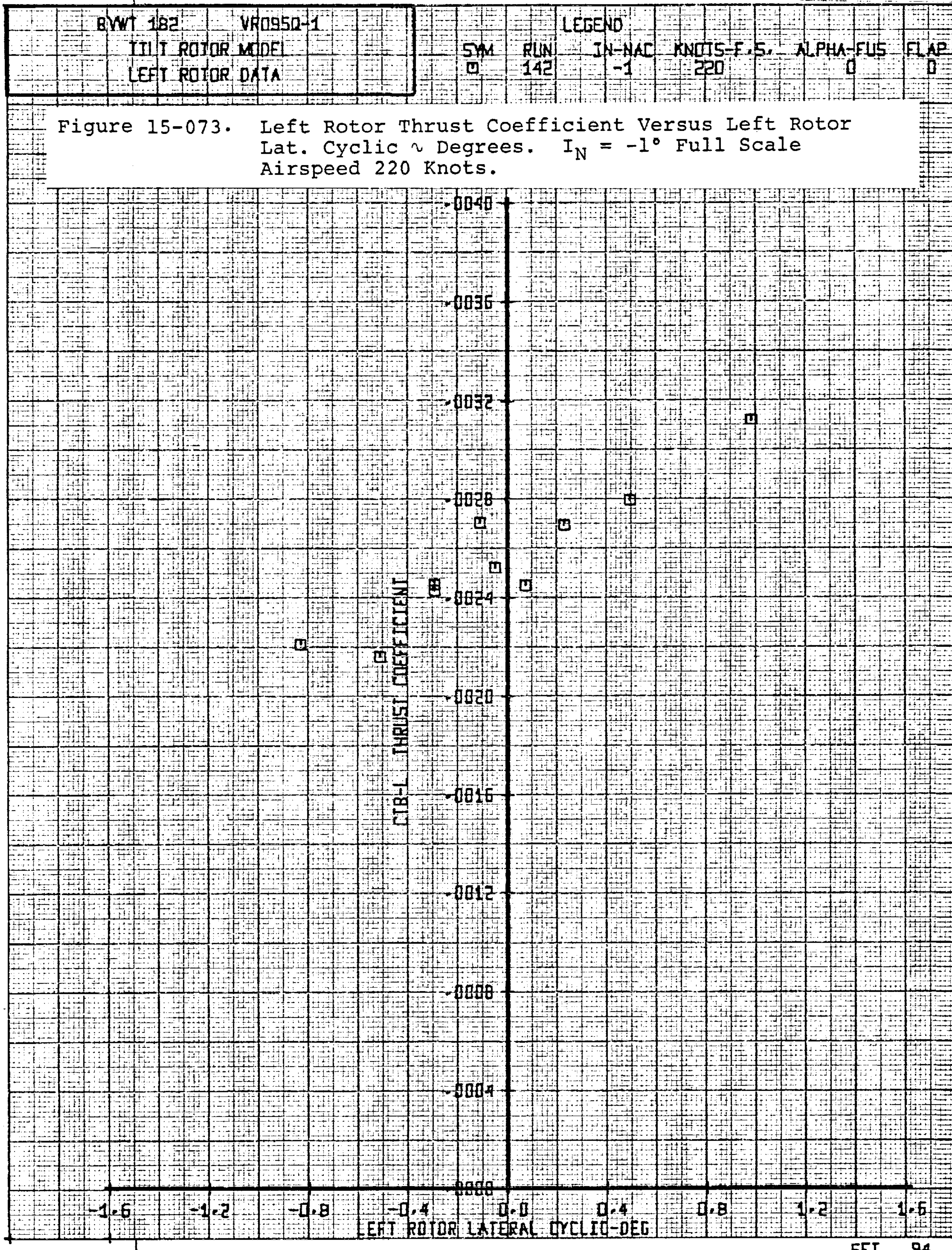

Figure 15-073. Left Rotor Thrust Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

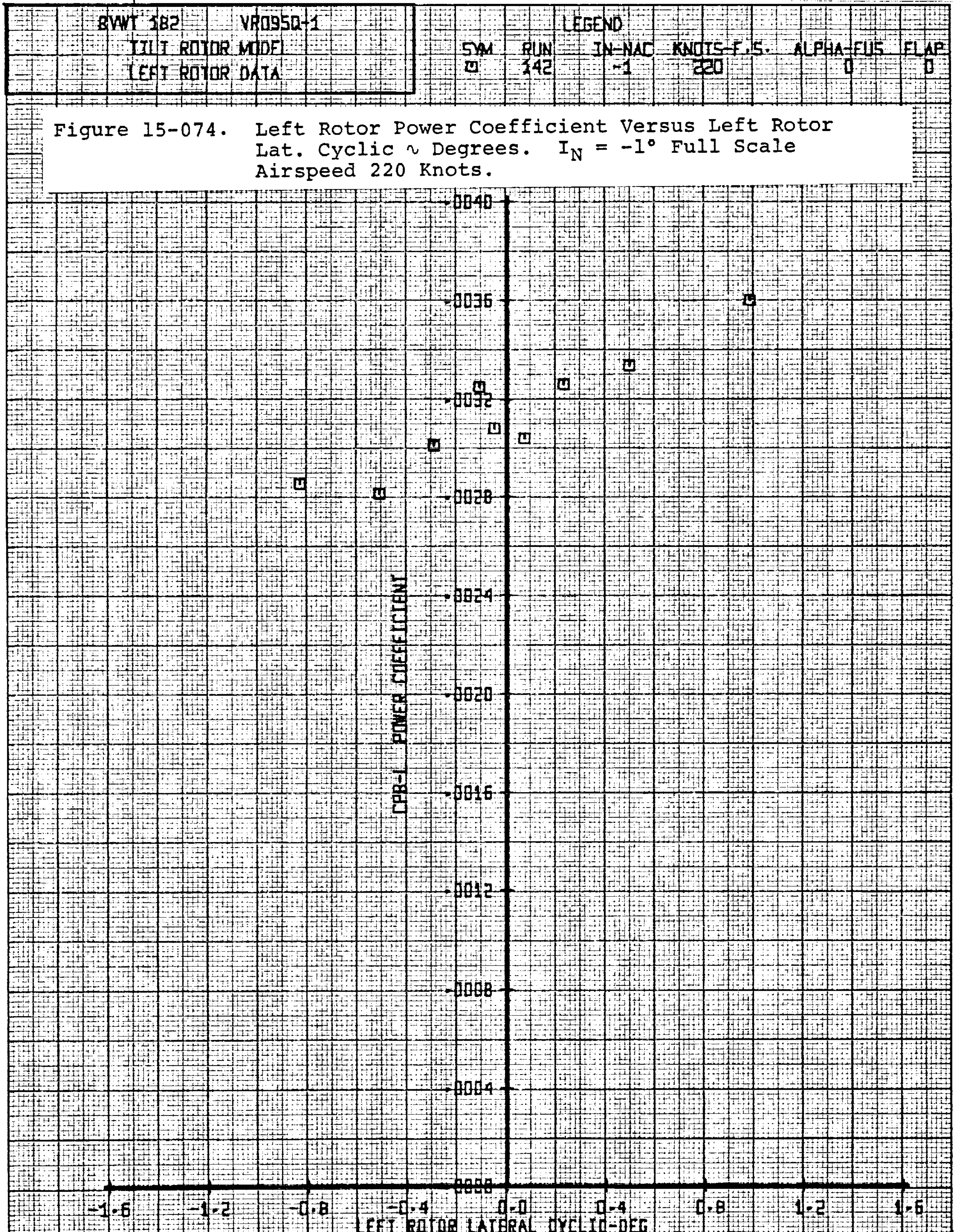

Figure 15-074. Left Rotor Power Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

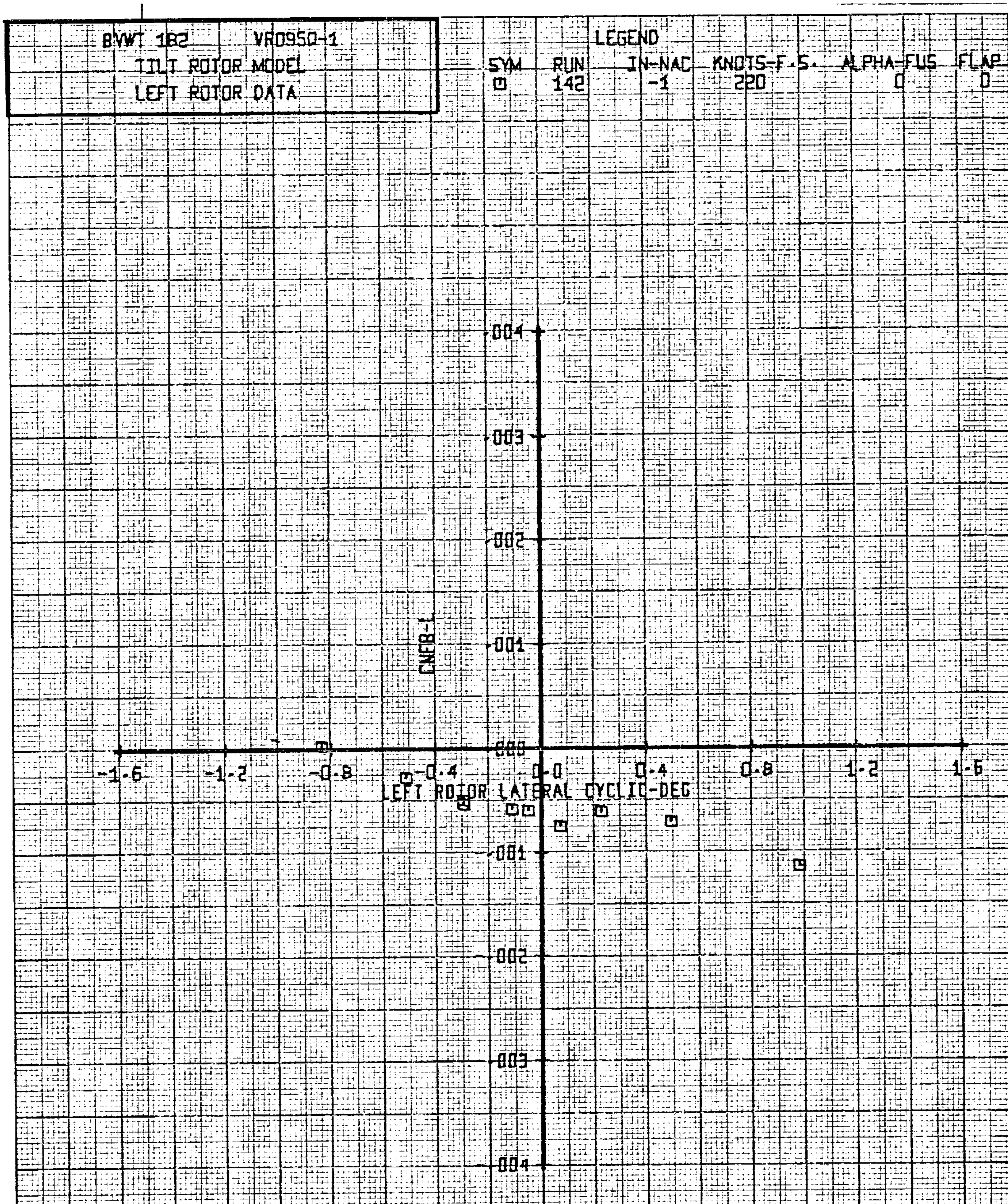

Figure 15-075. Left Rotor Normal Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

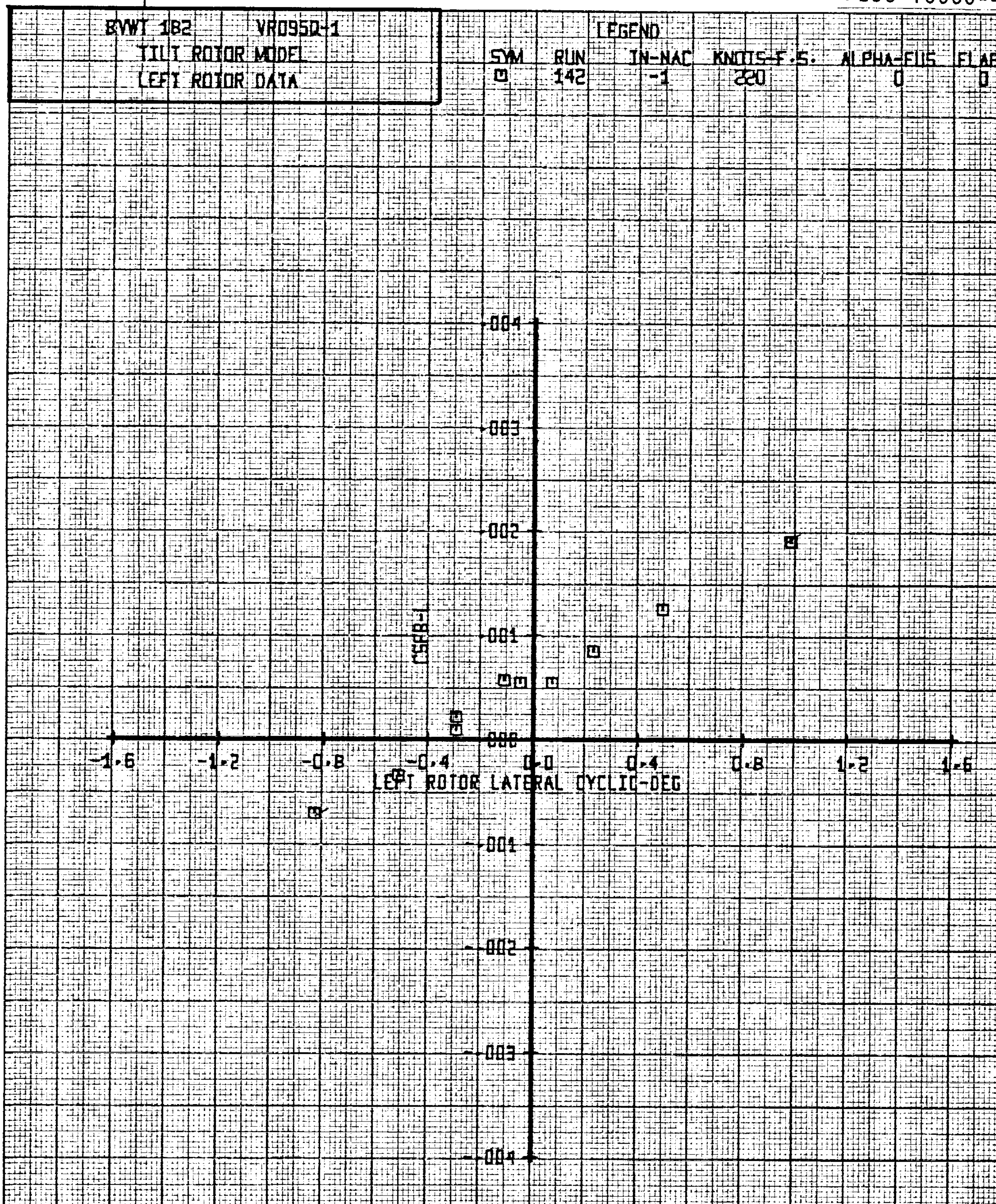

Figure 15-076. Left Rotor Side Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

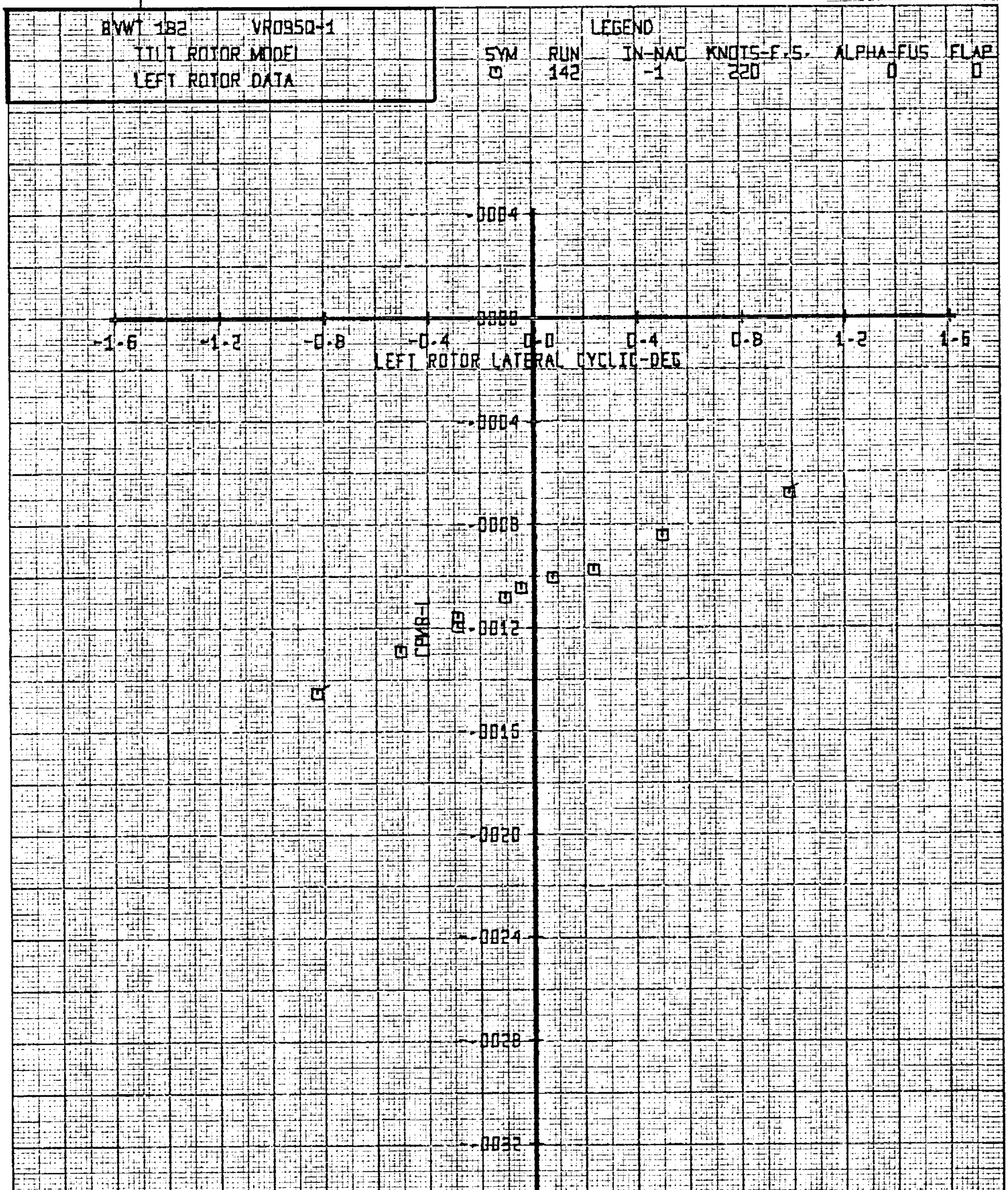

Figure 15-077. Left Rotor Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

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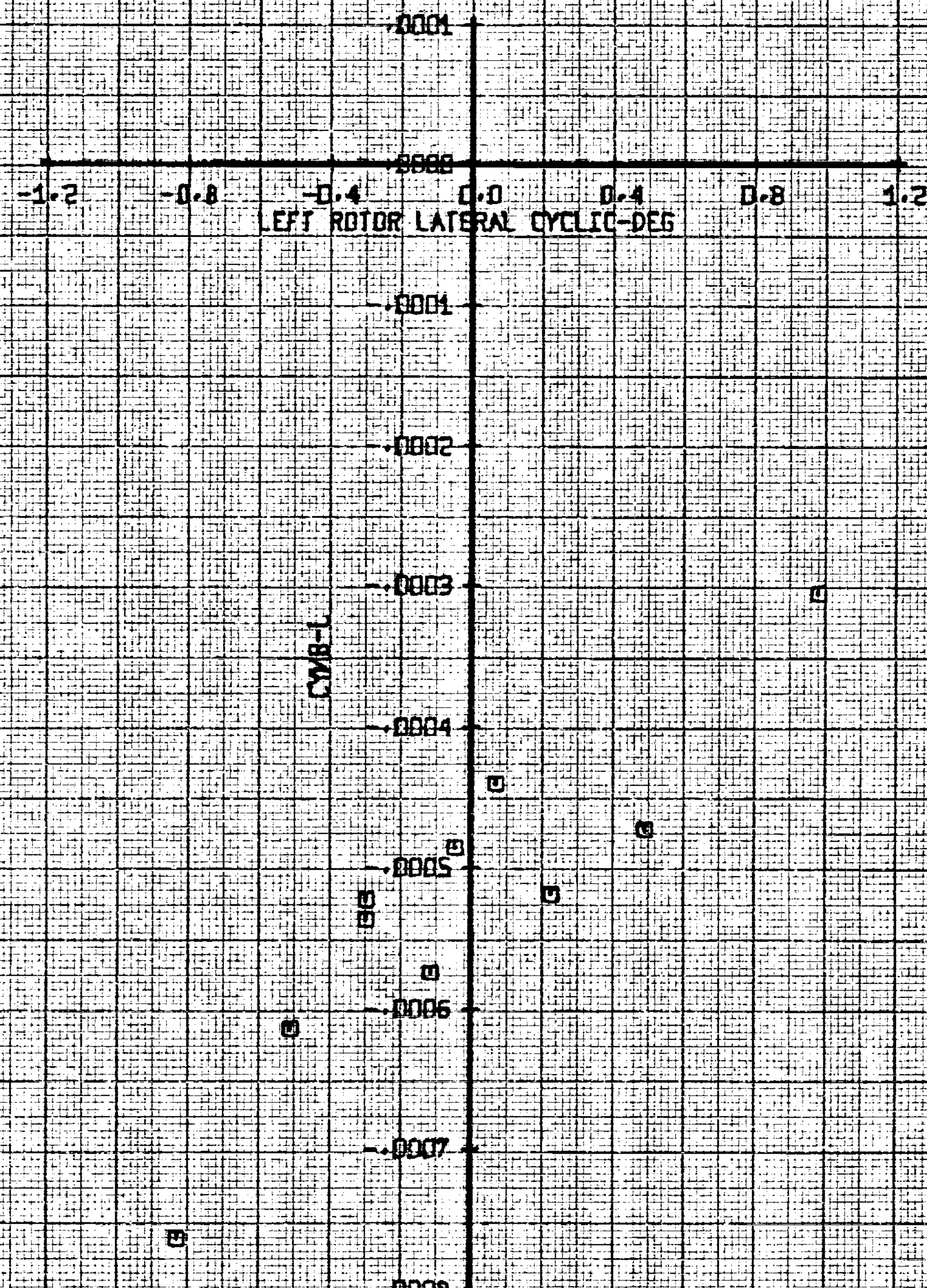
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	142	-1	220	0	0

Figure 15-078. Left Rotor Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.



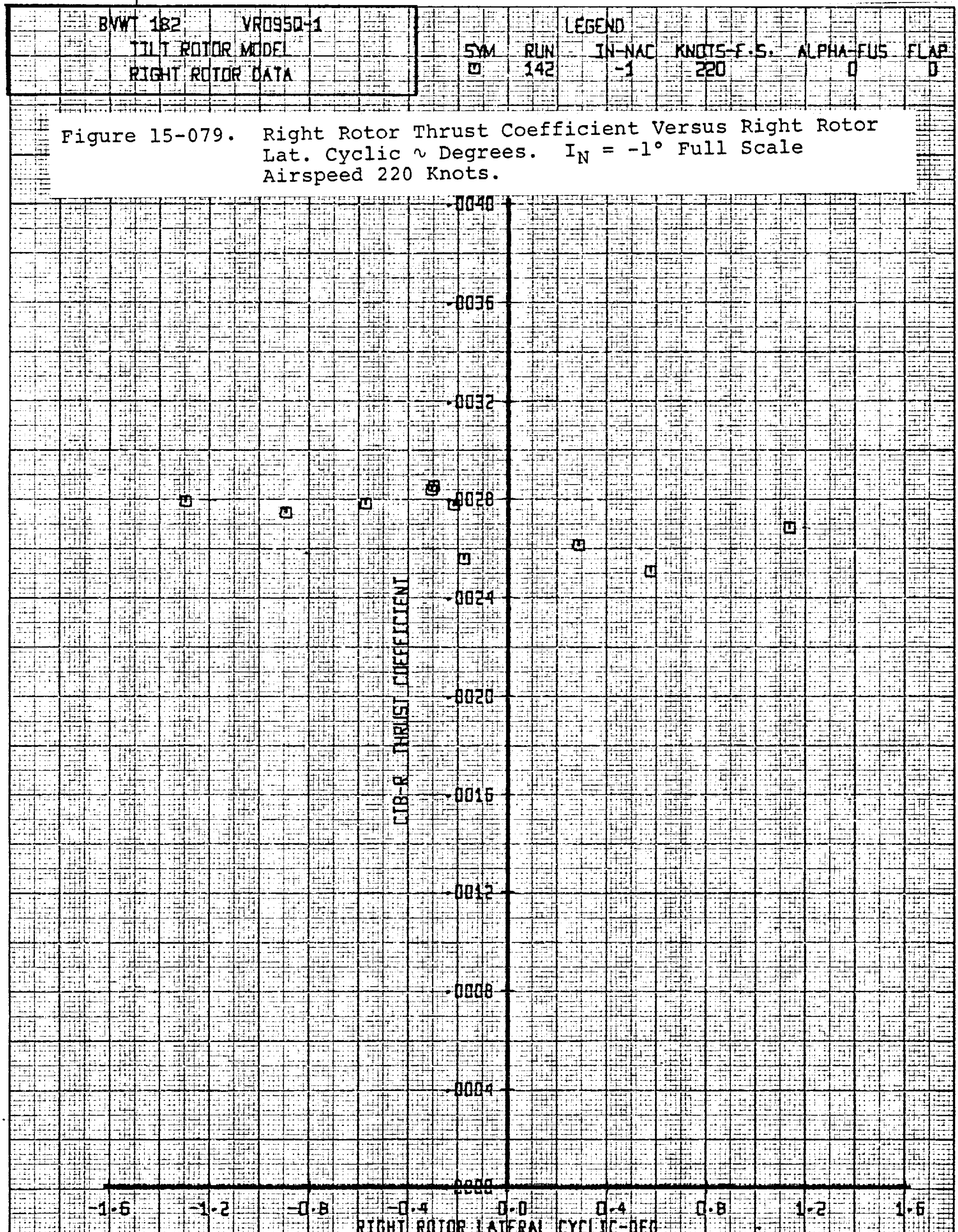


Figure 15-079. Right Rotor Thrust Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

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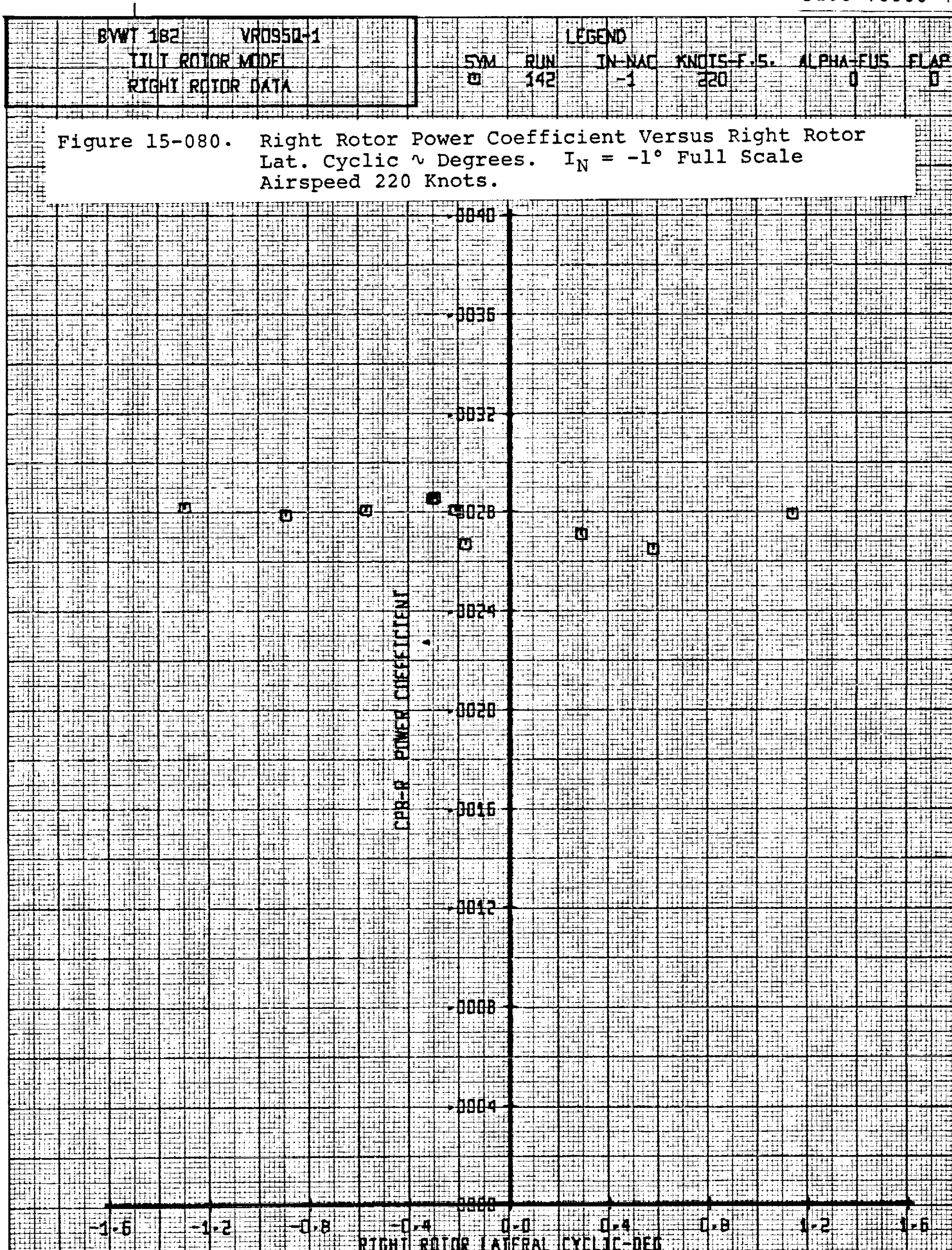
BVWT 182

Figure 15-080. Right Rotor Power Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.



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182

SET 94
BVWT 182

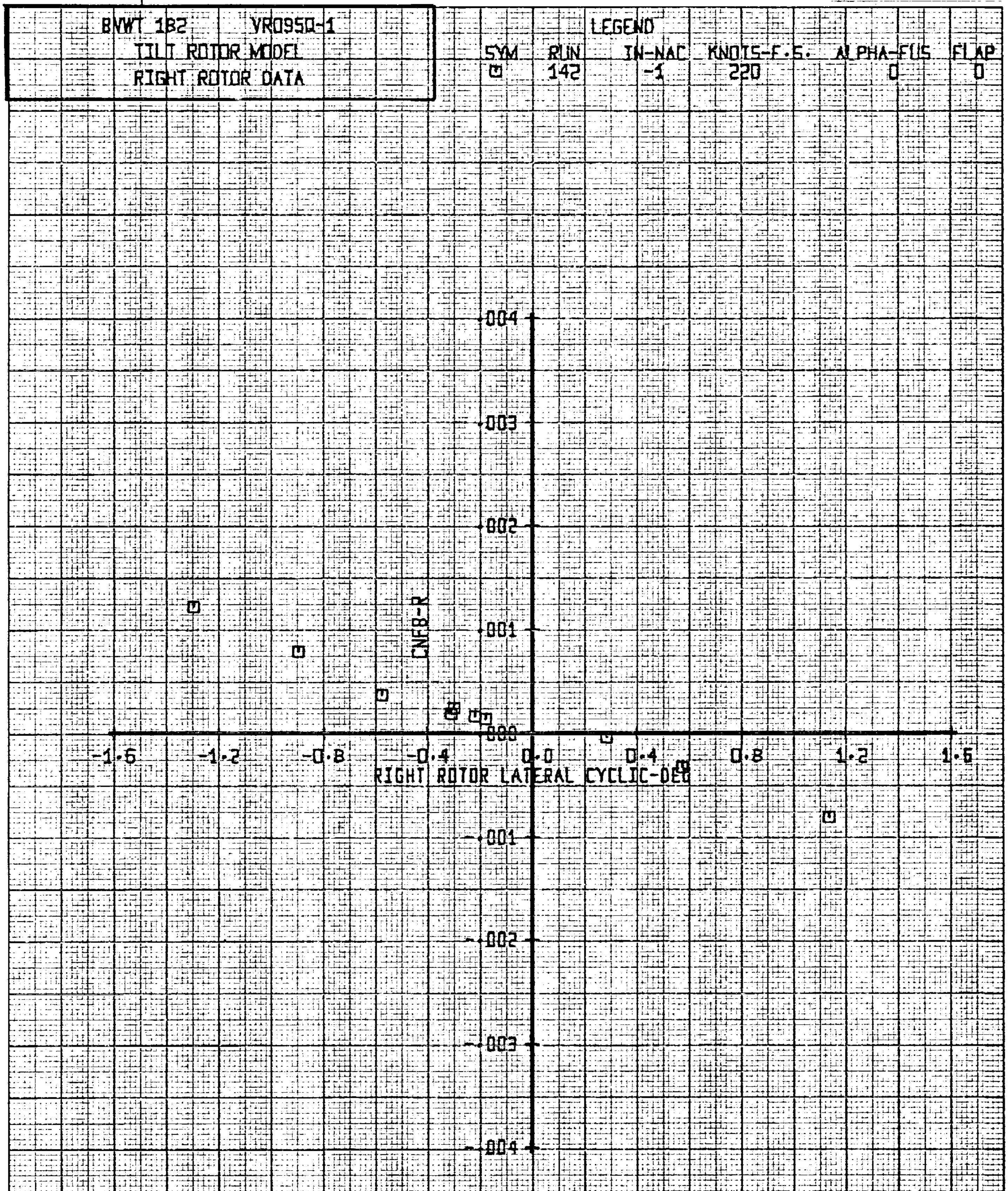


Figure 15-081. Right Rotor Normal Force Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.

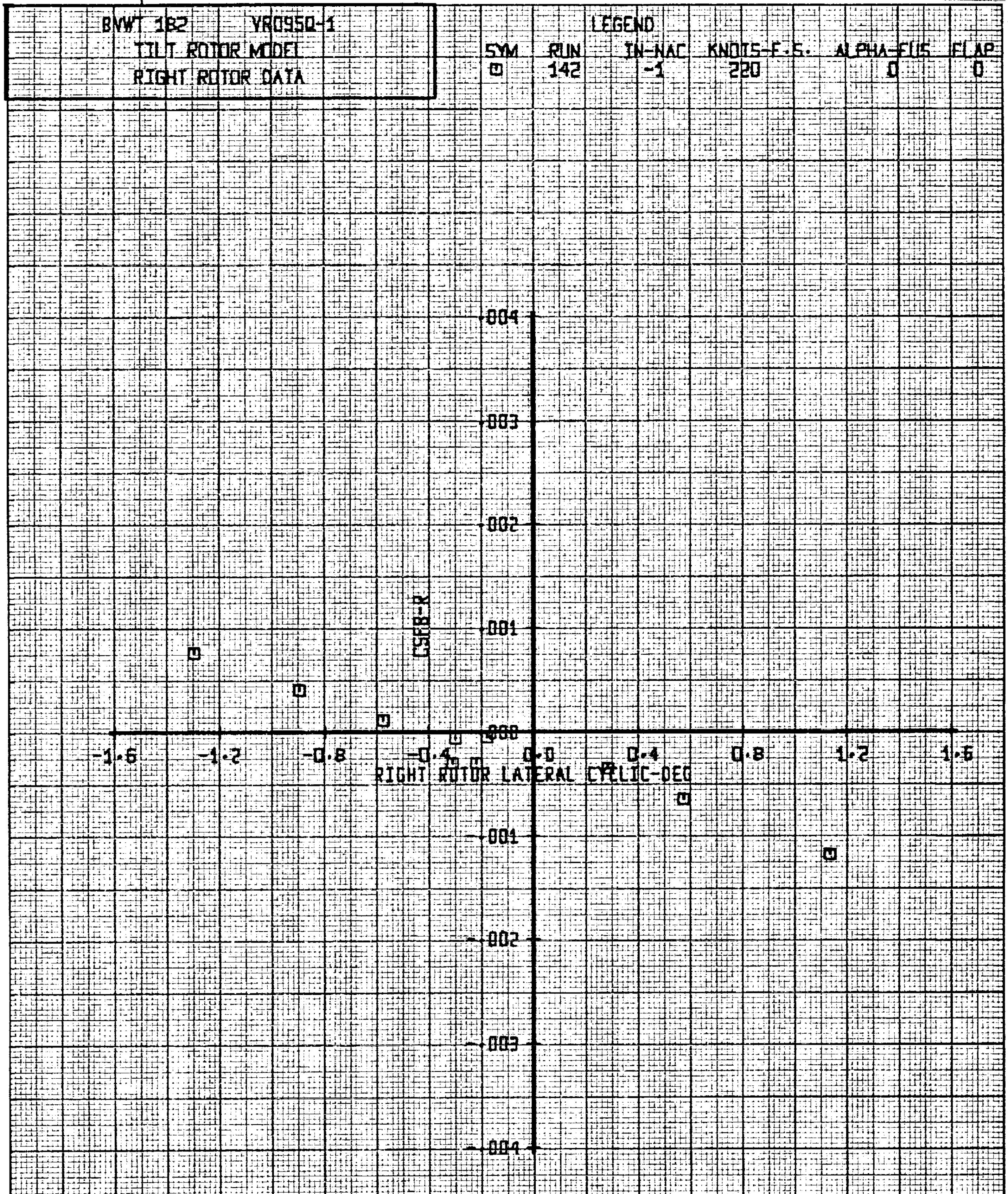


Figure 15-082. Right Rotor Side Force Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

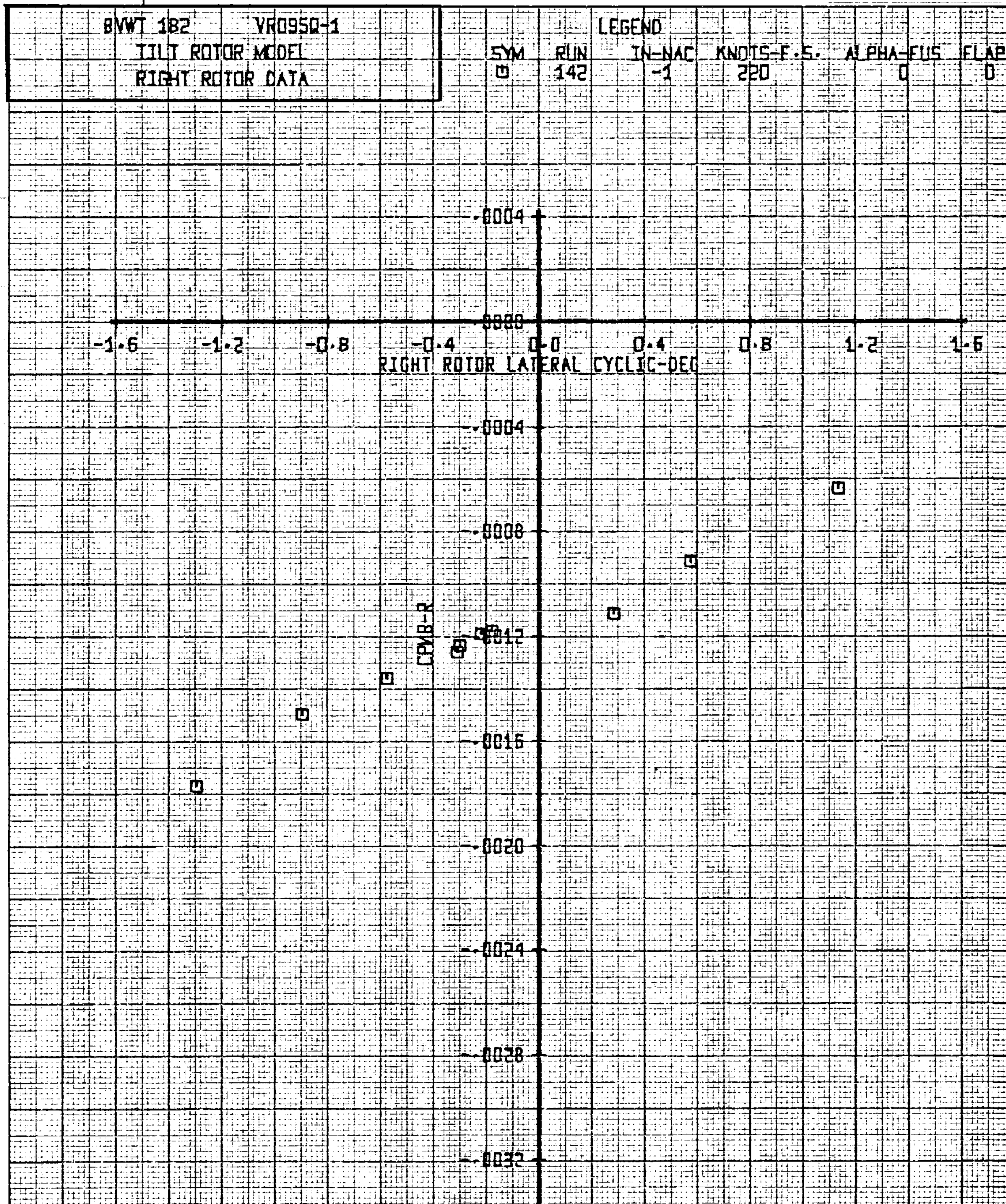


Figure 15-083. Right Rotor Pitching Moment Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

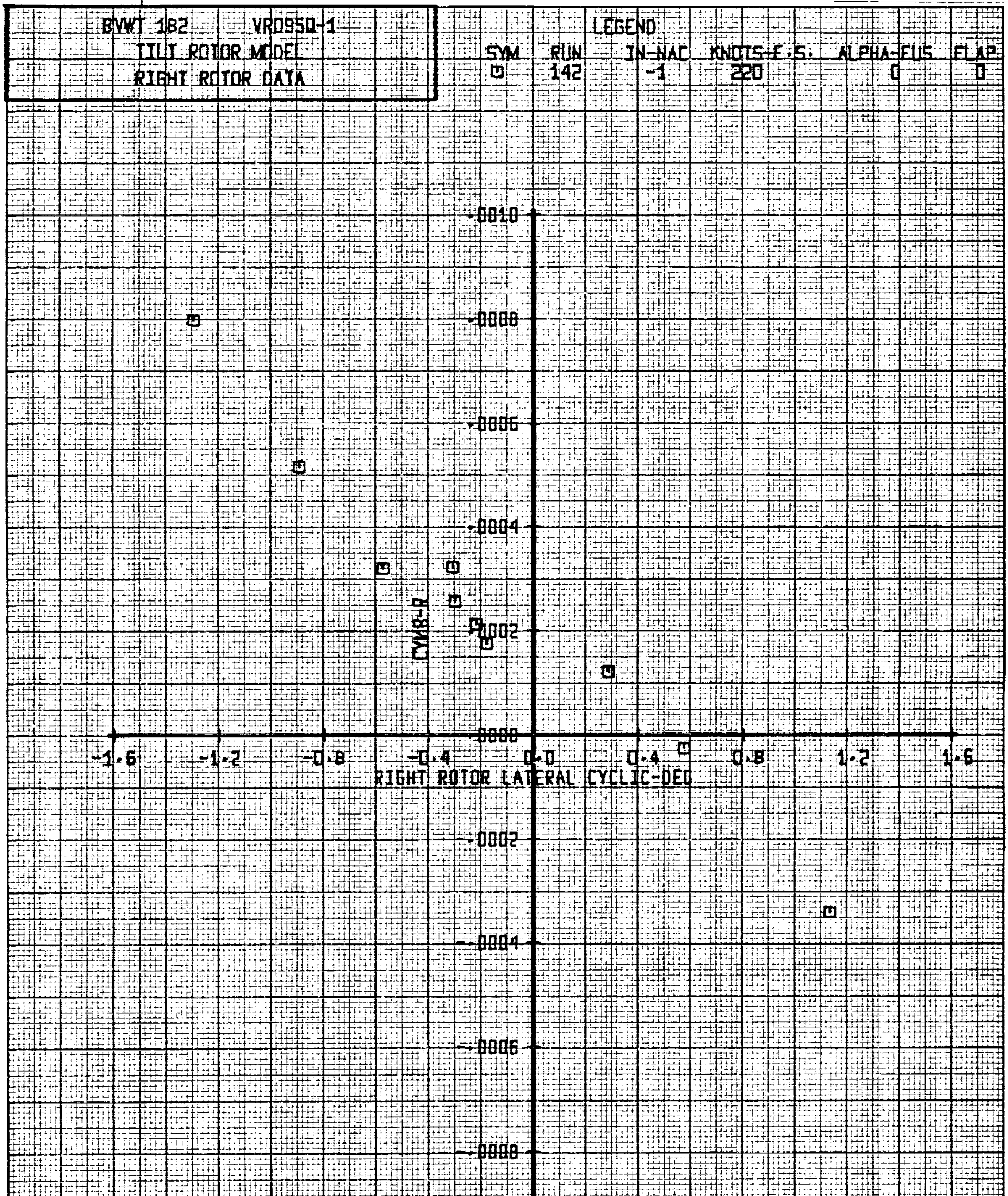


Figure 15-084. Right Rotor Yawing Moment Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

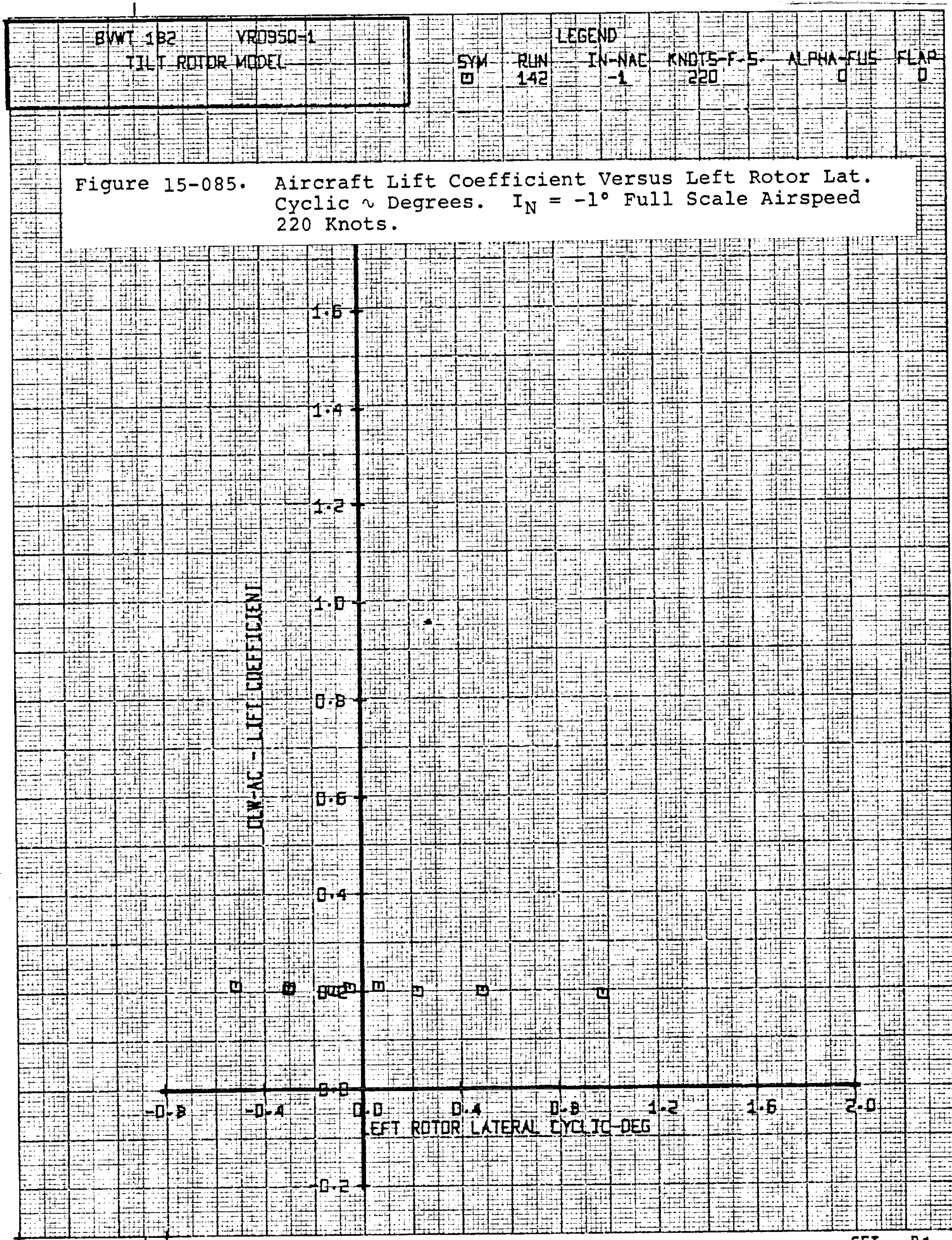


Figure 15-085. Aircraft Lift Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

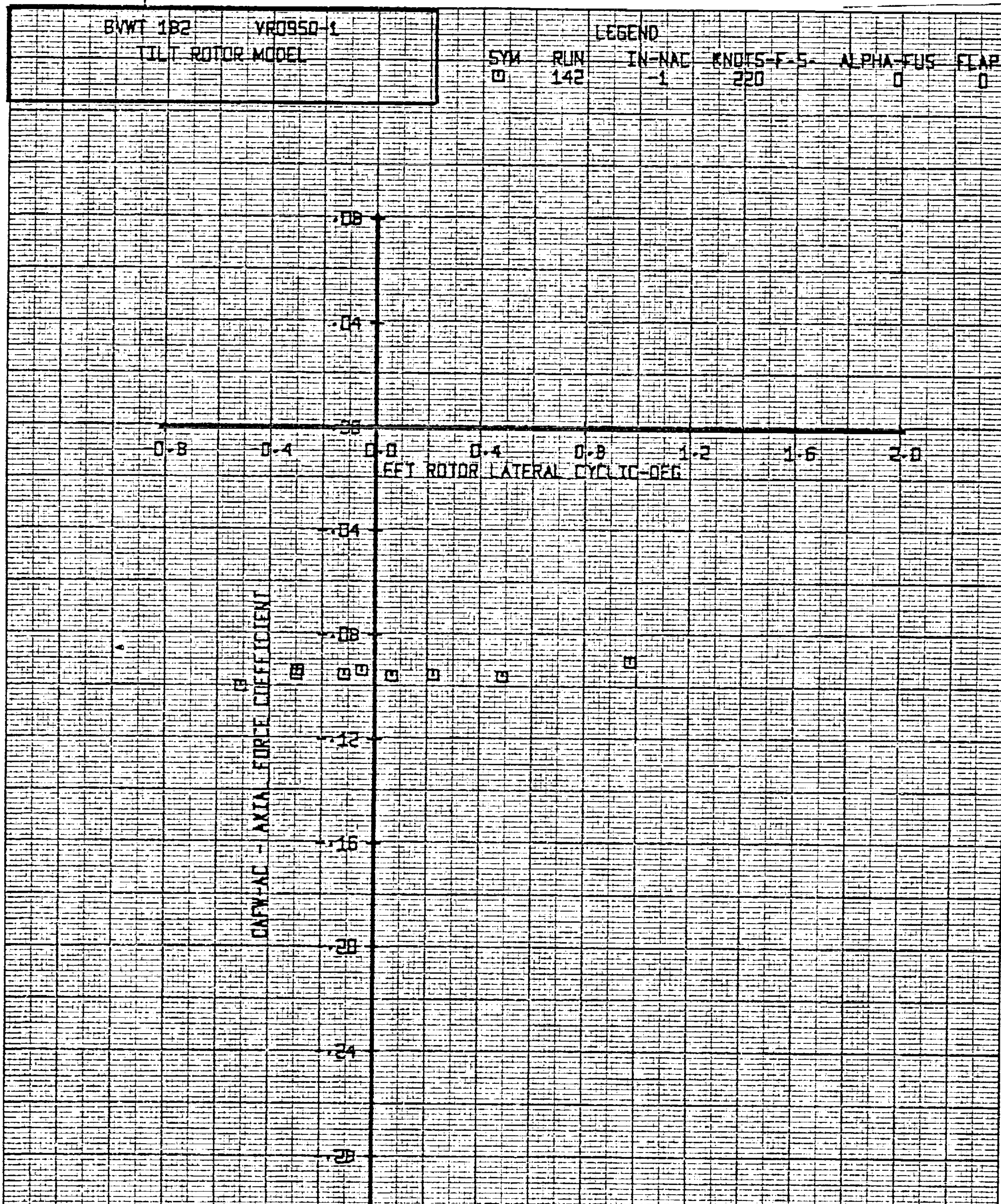


Figure 15-086. Aircraft Side Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.

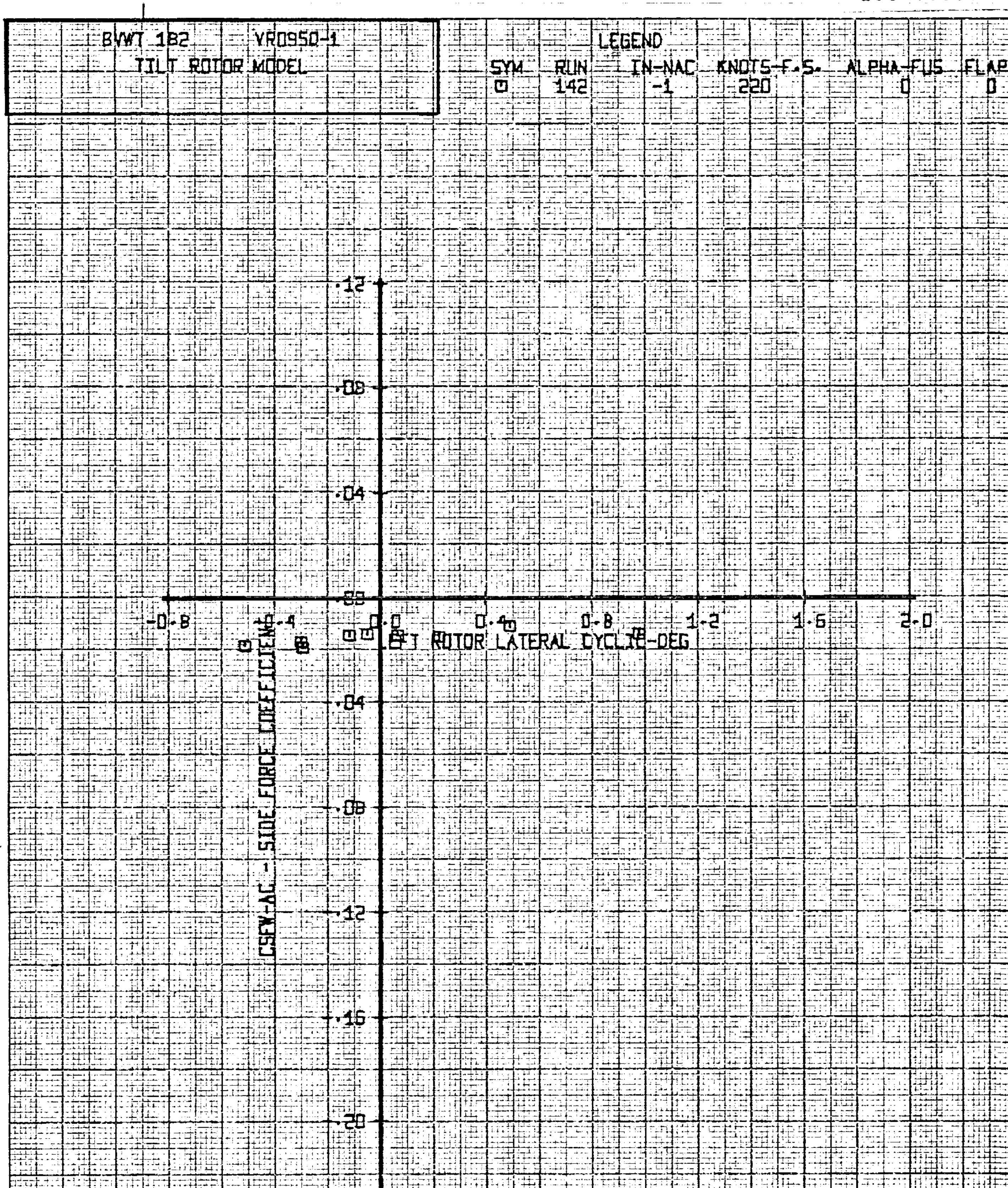


Figure 15-087. Aircraft Axial Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 200 Knots.

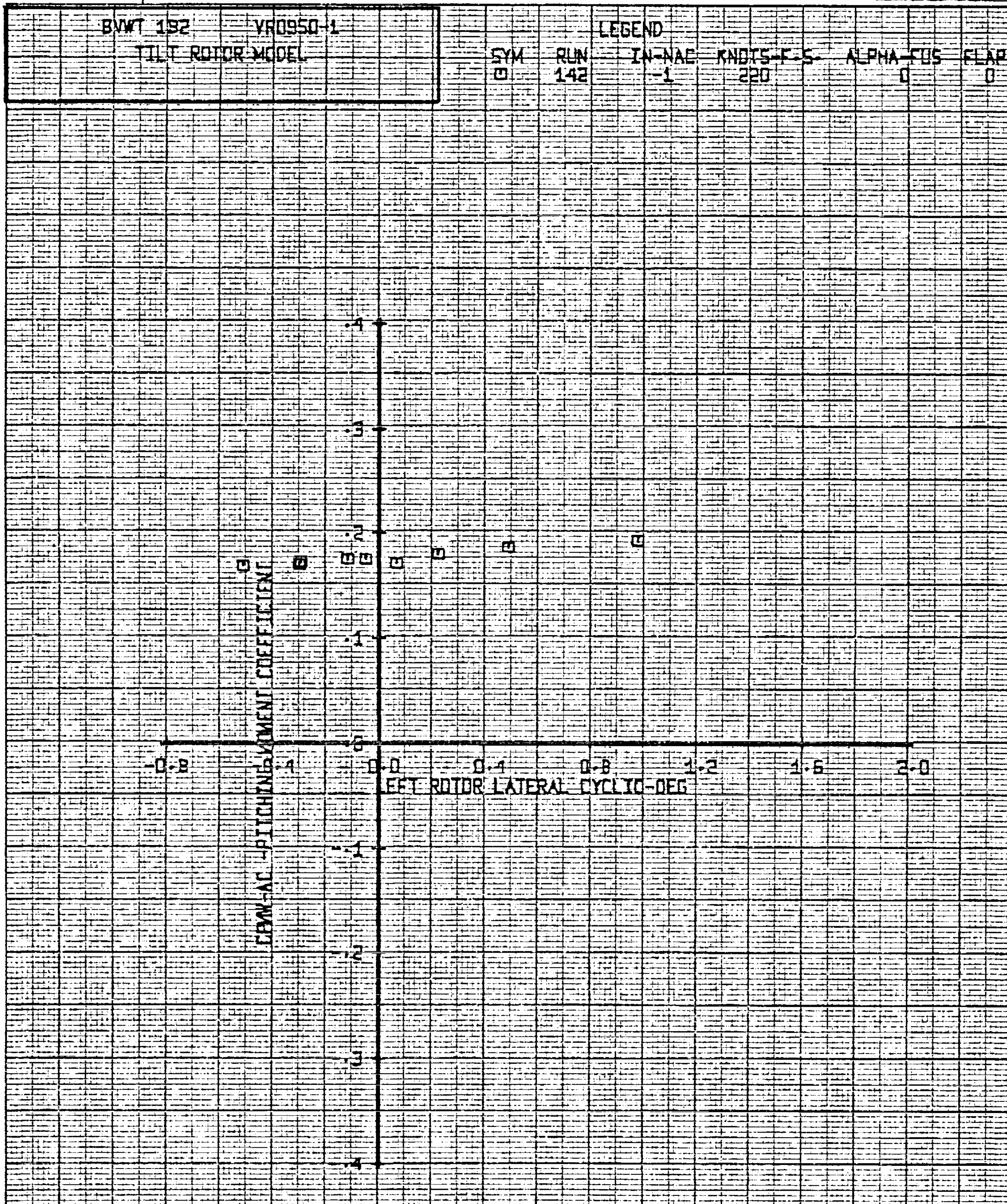


Figure 15-088. Aircraft Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

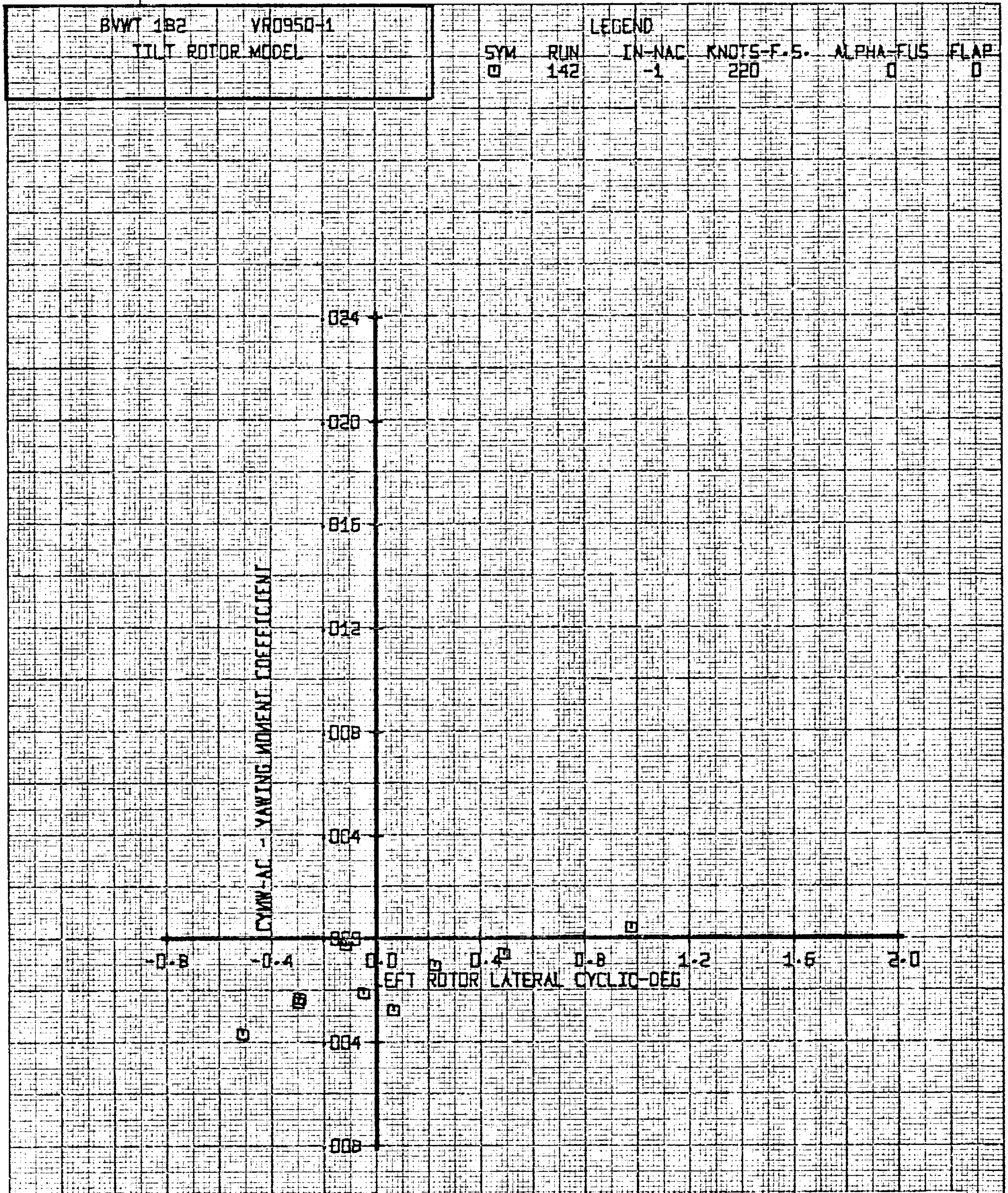


Figure 15-089. Aircraft Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

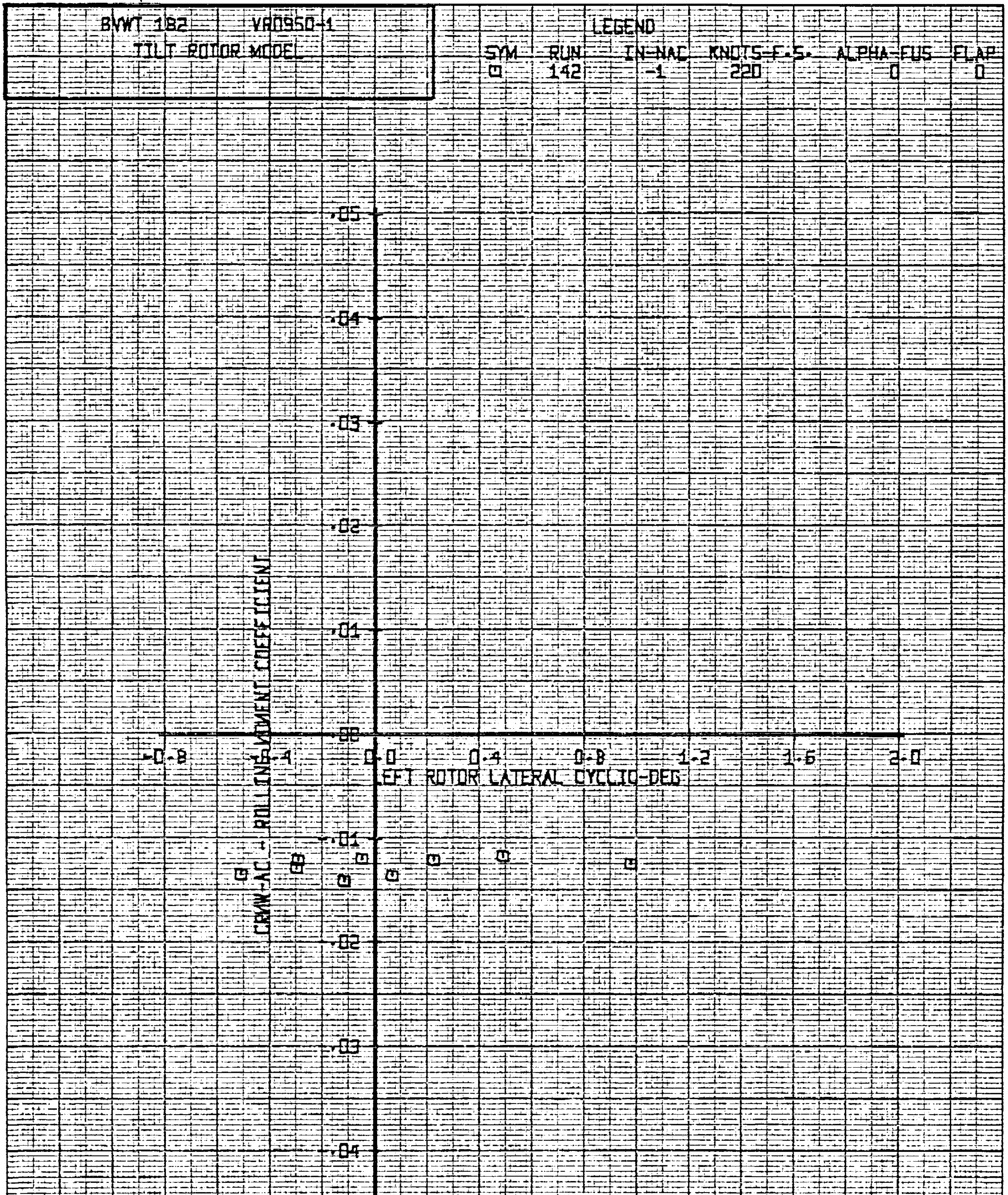


Figure 15-090. Aircraft Rolling Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

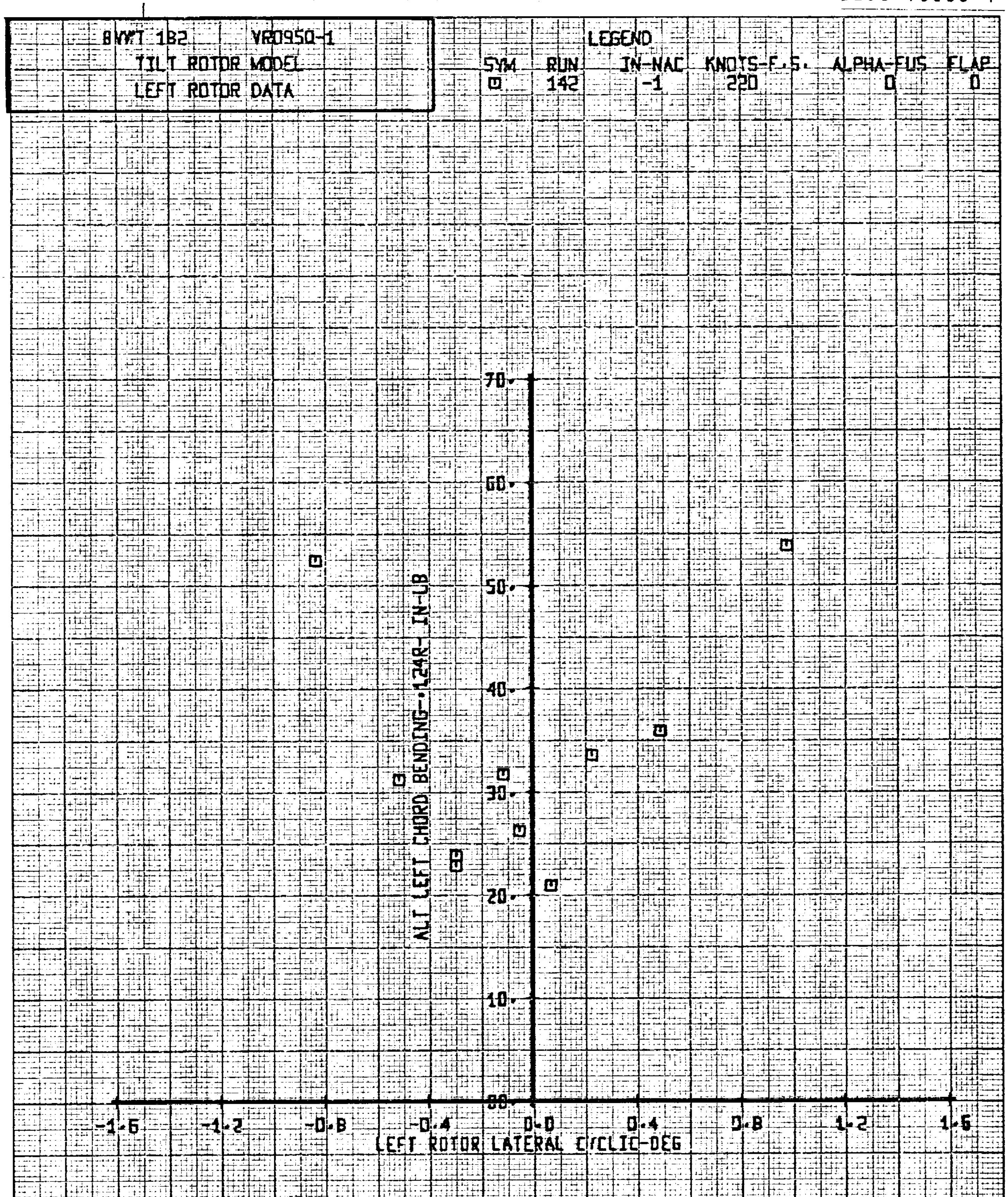


Figure 15-091. Alt. Left Chord Bending Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 220 Knots.

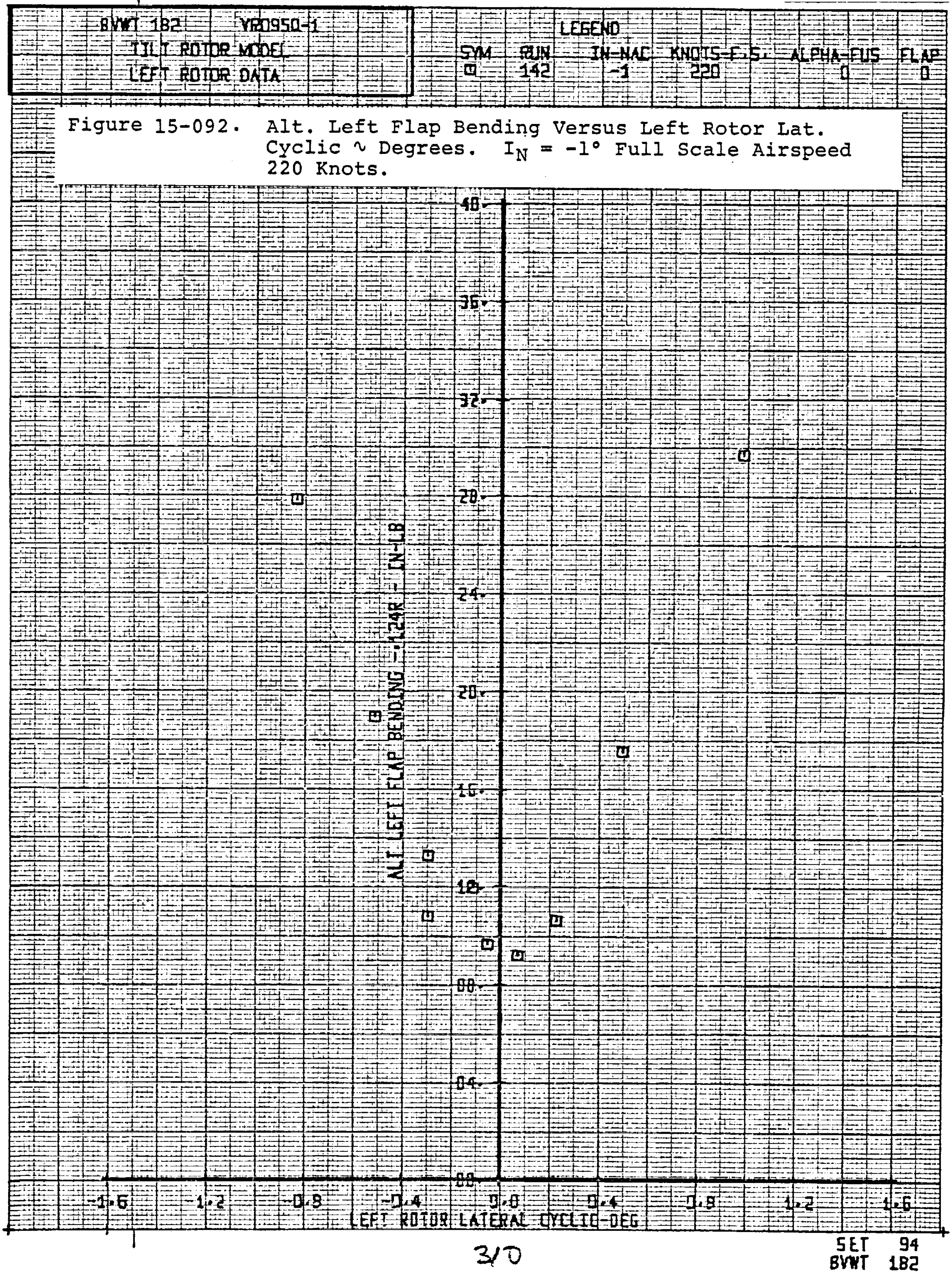


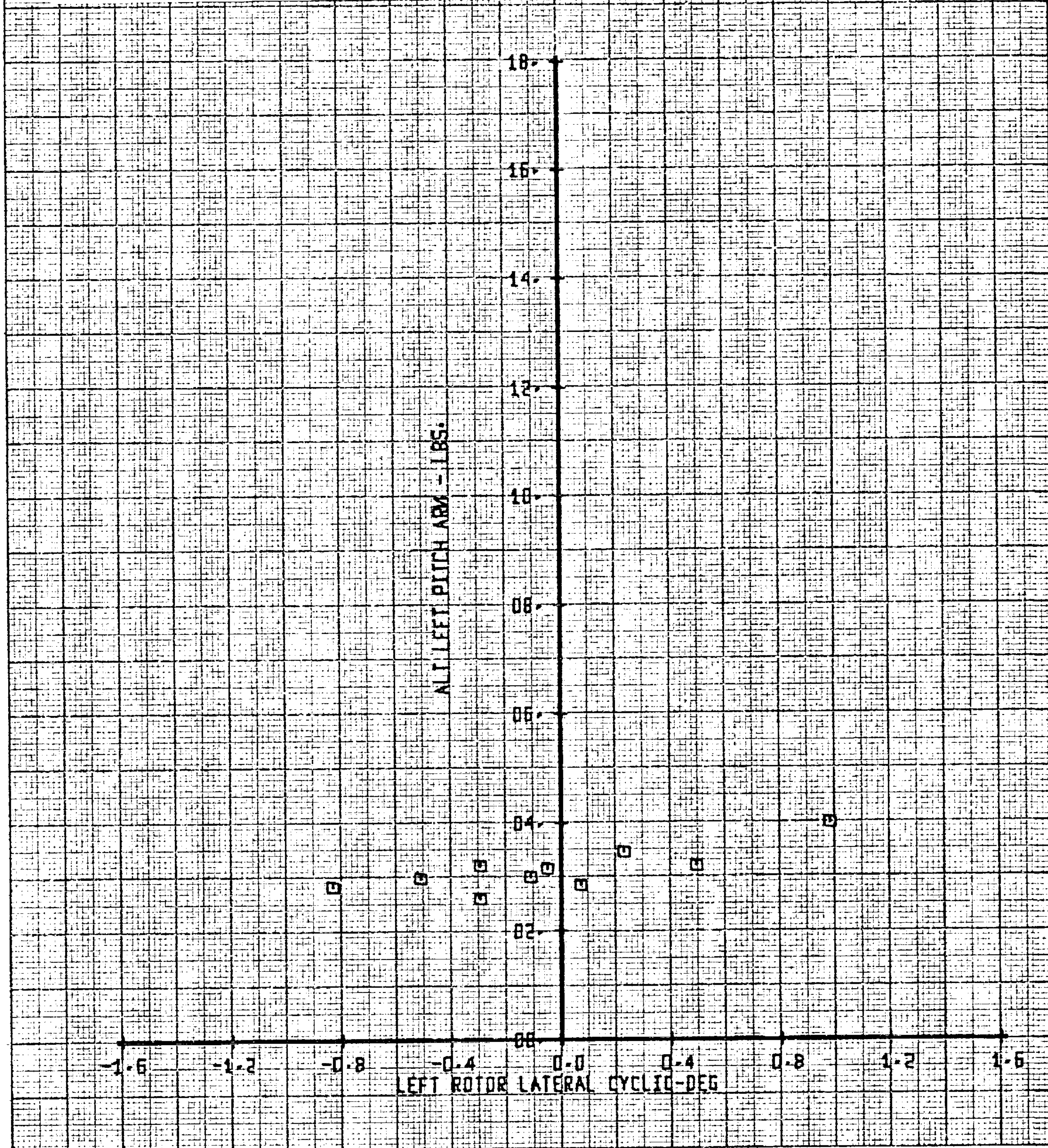
Figure 15-092. Alt. Left Flap Bending Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

BVWT 182	VR095D-1
TILT ROTOR MODEL	
LEFT ROTOR DATA	

LEGEND

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	142	-1	220	0	0

Figure 15-093. Alt. Left Pitch Link Load Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.



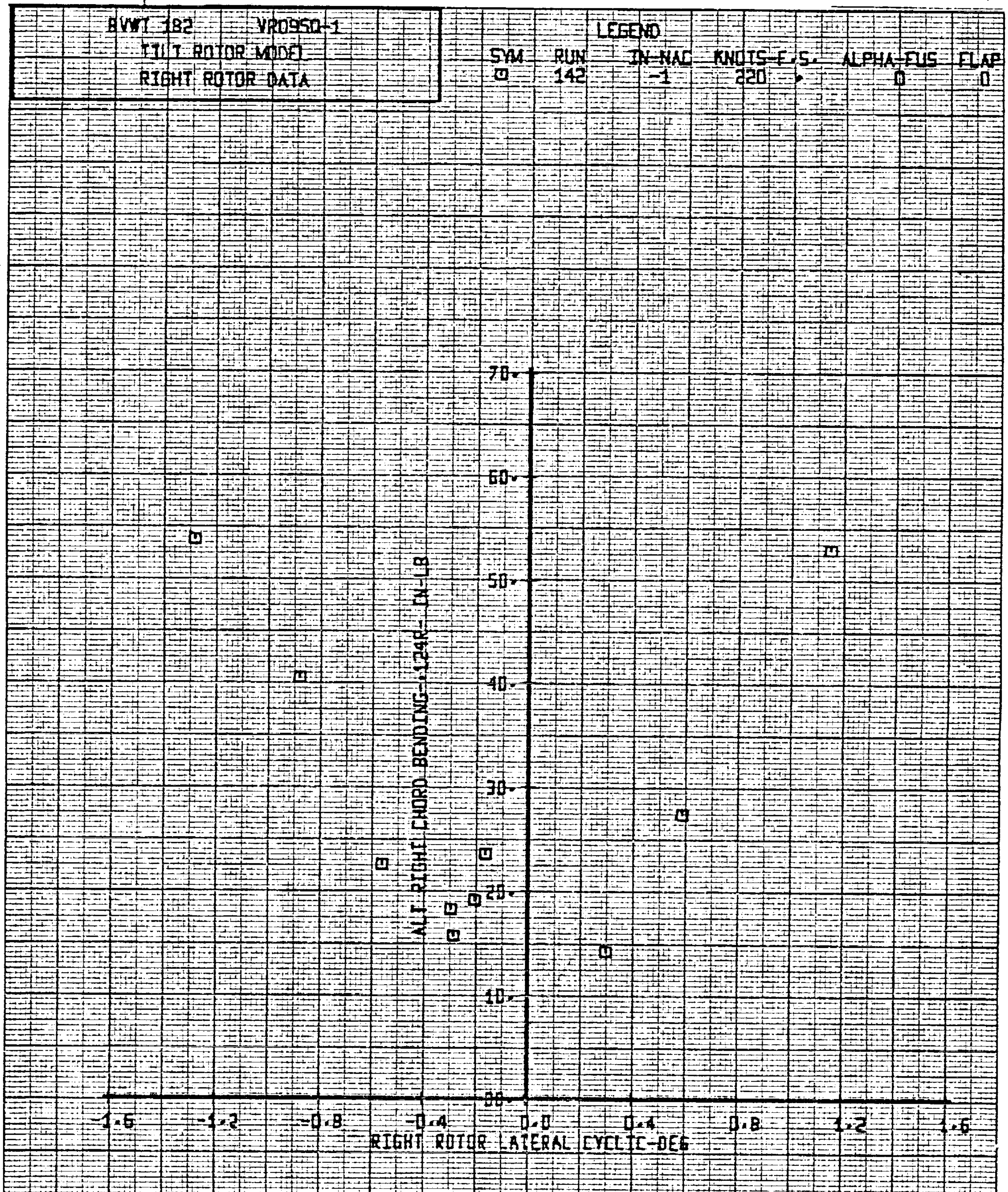


Figure 15-094. Alt. Right Chord Bending Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

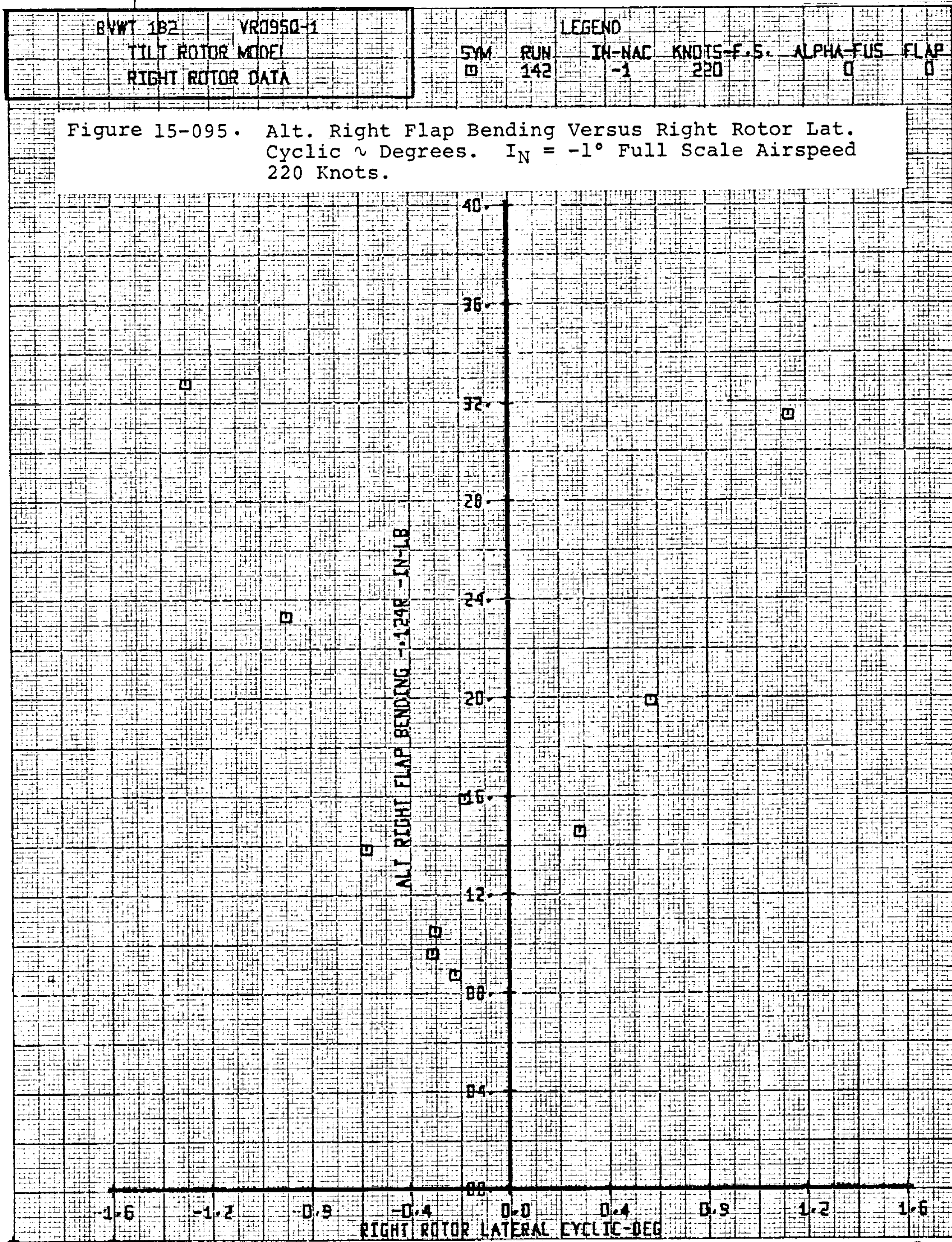
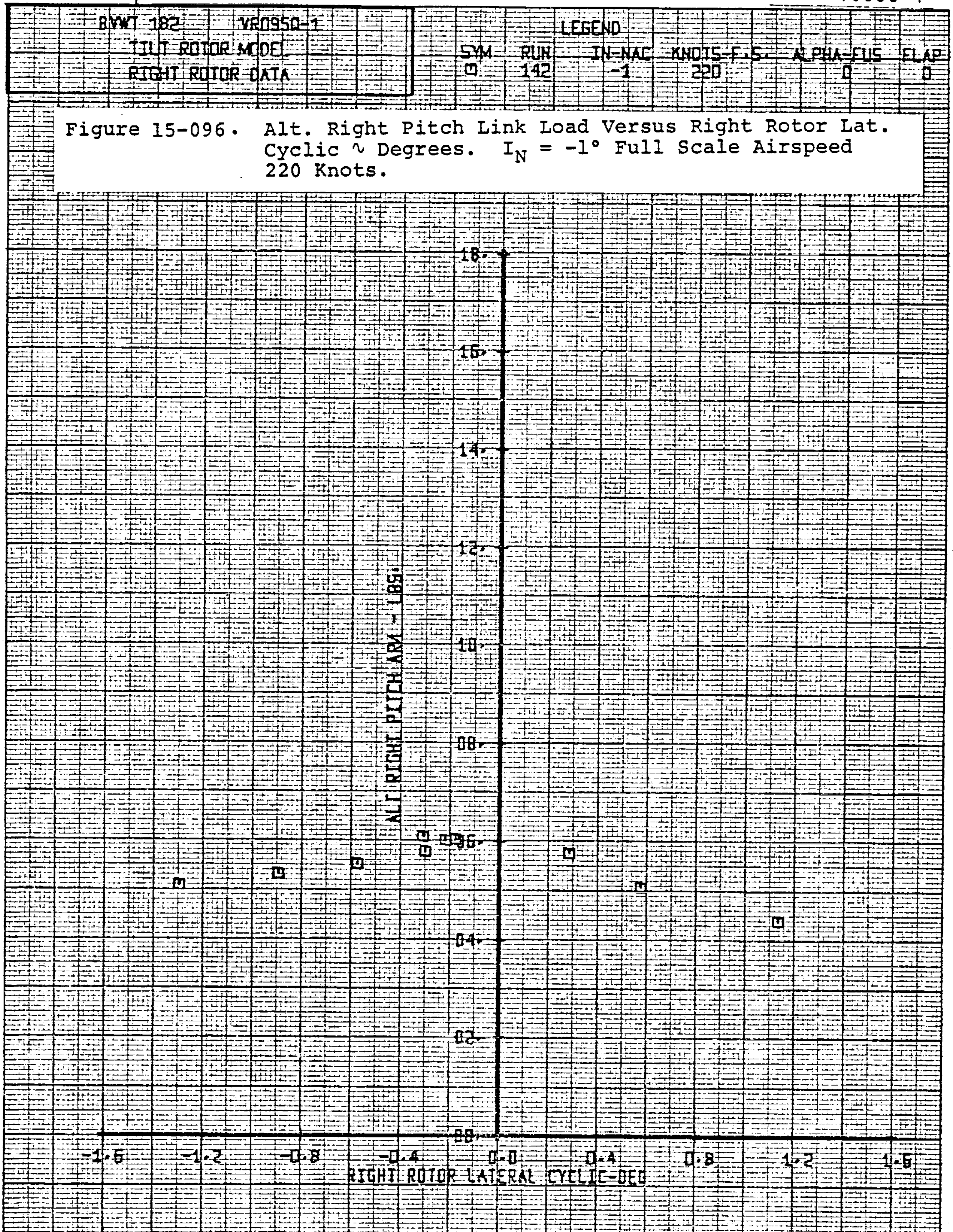


Figure 15-095. Alt. Right Flap Bending Versus Right Rotor Lat. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.

Figure 15-096. Alt. Right Pitch Link Load Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 220 Knots.



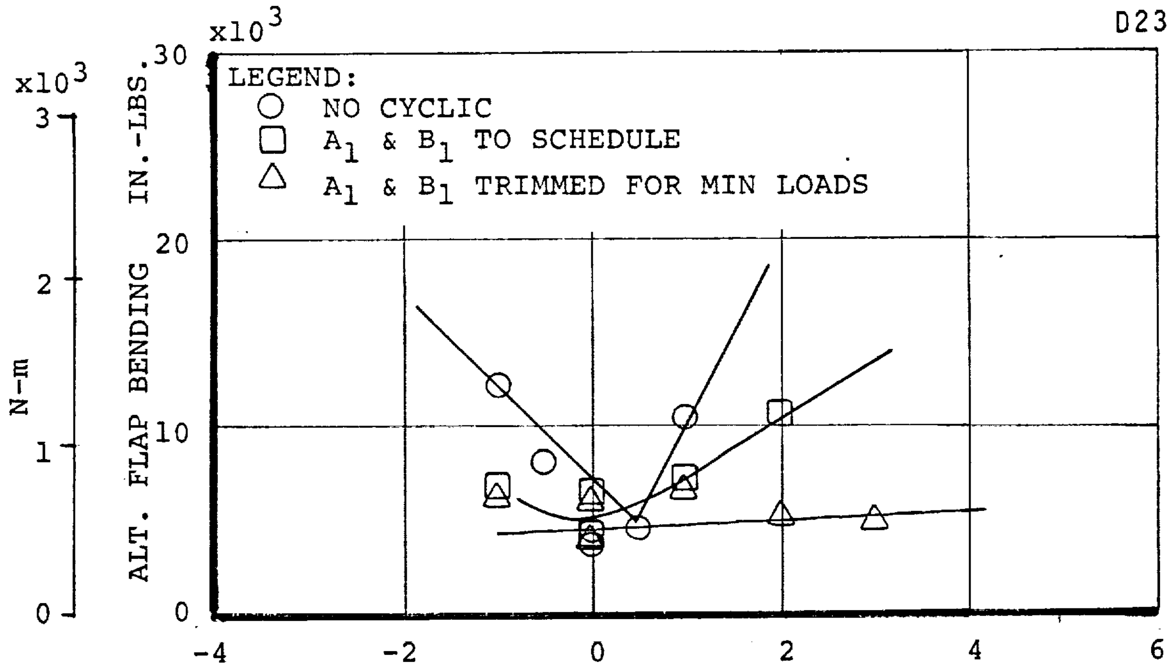


Figure 15-098. Alt. Left Rotor Blade Flap Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. I_N = -1° Full Scale Airspeed 220 Knots.

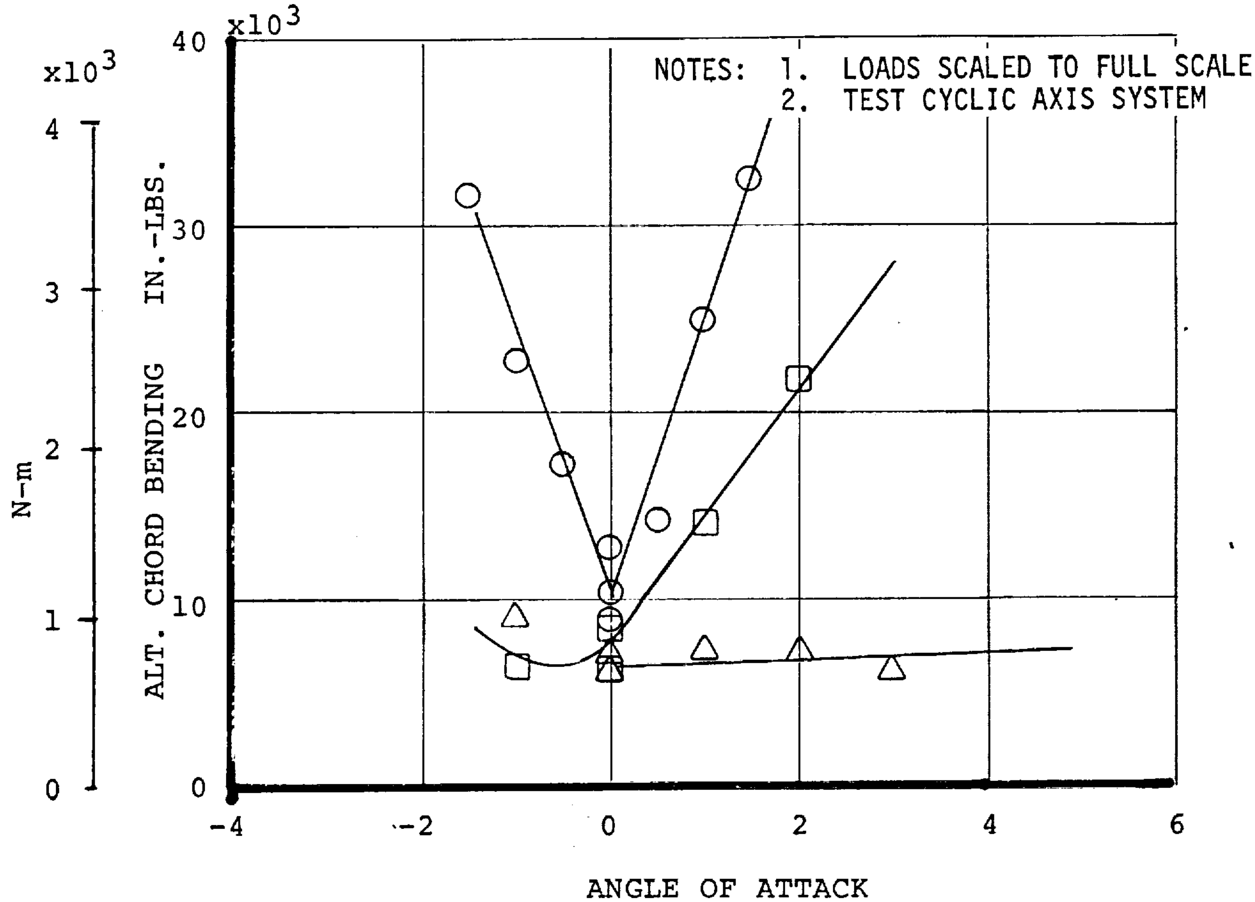


Figure 15-097. Alt. Left Rotor Blade Chord Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. I_N = -1° Full Scale Airspeed 220 Knots.

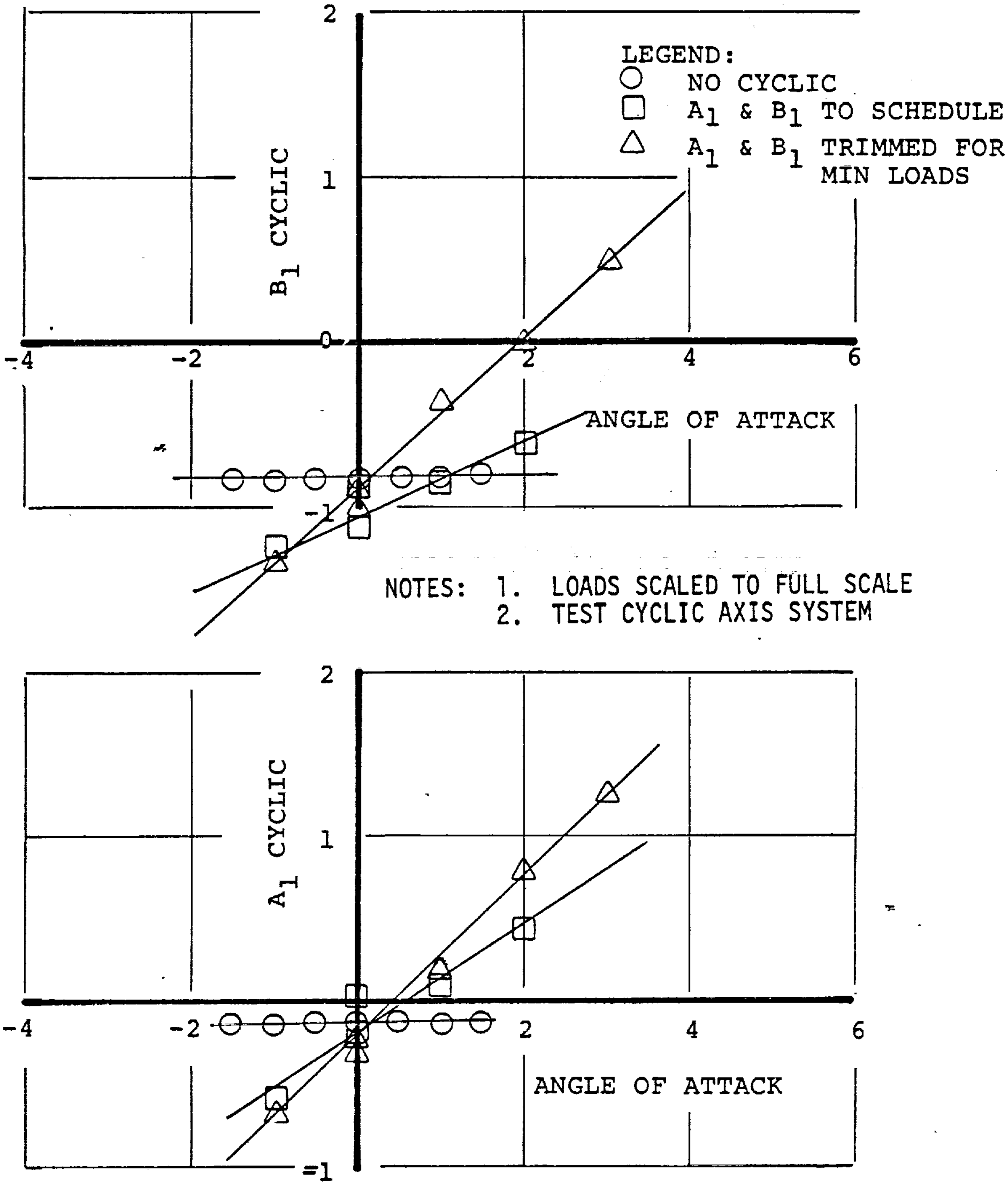


Figure 15-099. Left Rotor Cyclic Schedules. $I_N = -1°$ Full Scale Airspeed 220 Knots.

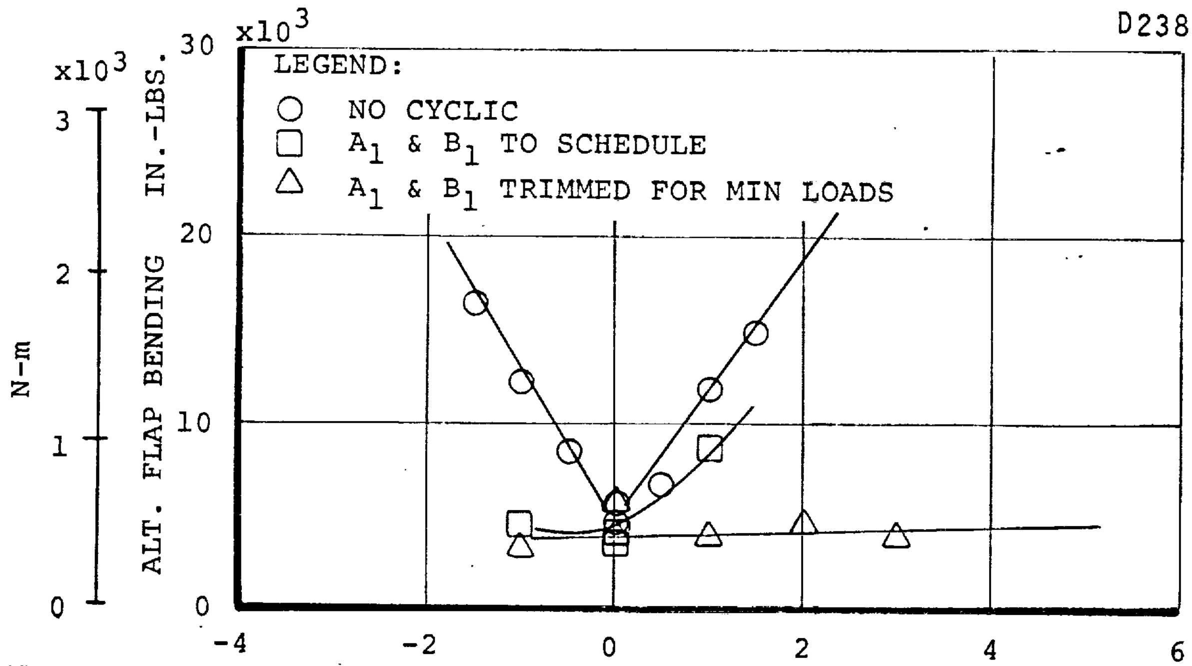


Figure 15-101. Alt. Right Rotor Blade Flap Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. $I_N = -1°$ Full Scale Airspeed 220 Knots.

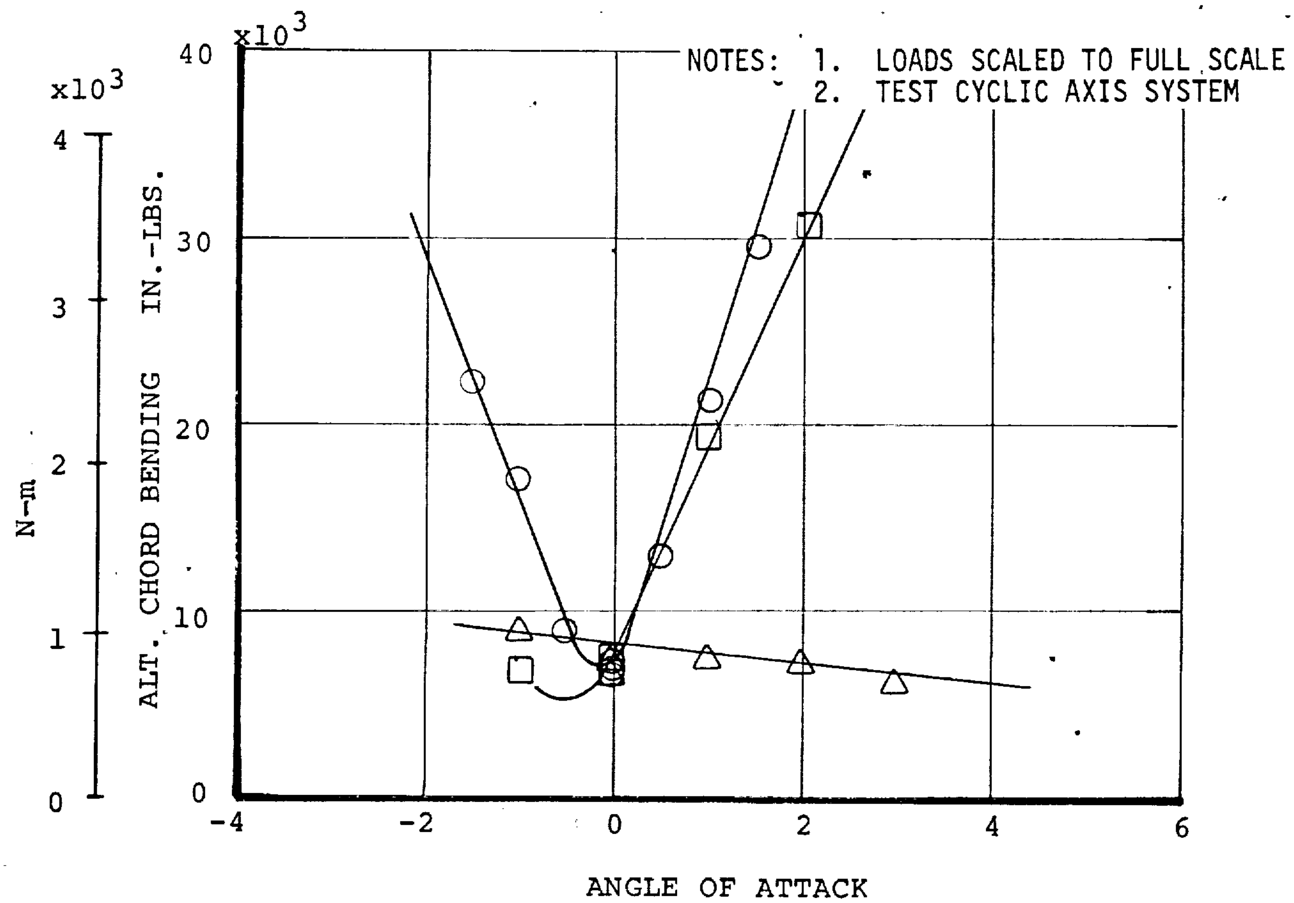


Figure 15-100. Alt. Right Rotor Blade Chord Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. $I_N = -1°$ Full Scale Airspeed 220 Knots.

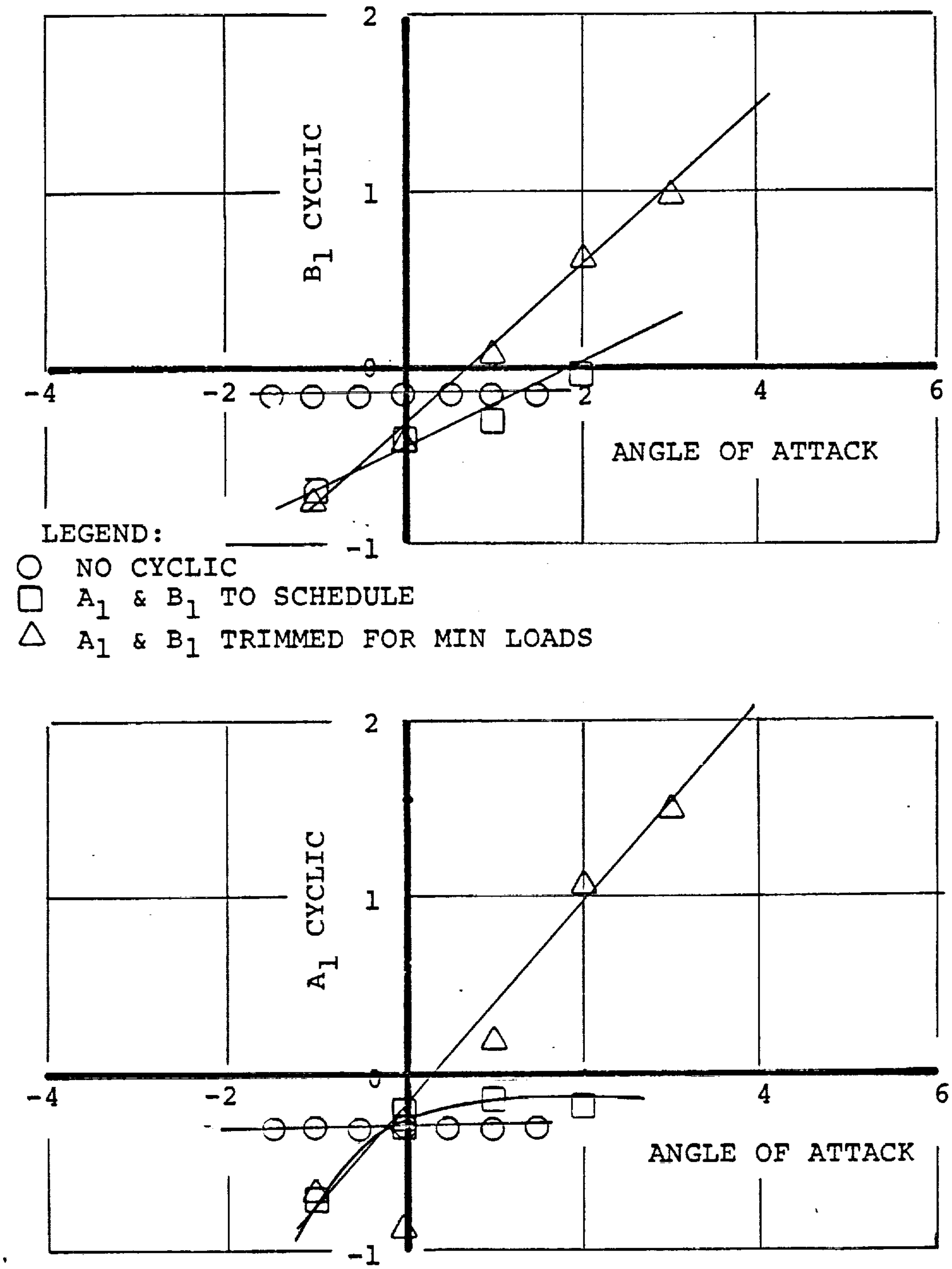


Figure 15-102. Right Rotor Cyclic Schedules. $I_N = -1°$ Full Scale Airspeed 220 Knots.

$I_N = -1^o \; V_{FS} = 260$ KTS.

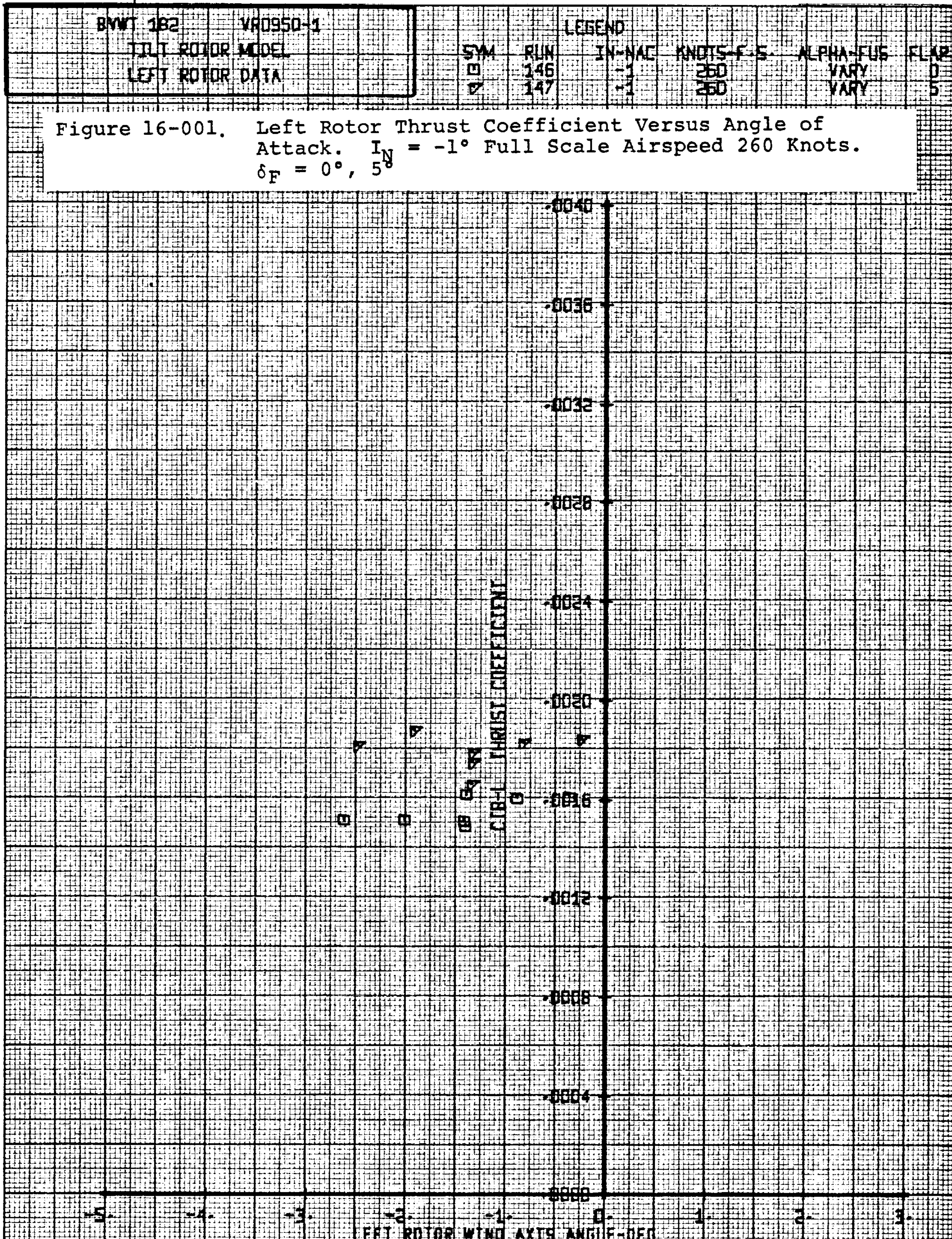


Figure 16-001. Left Rotor Thrust Coefficient Versus Angle of Attack. I_N = -1° Full Scale Airspeed 260 Knots. δ_F = 0°, 5°

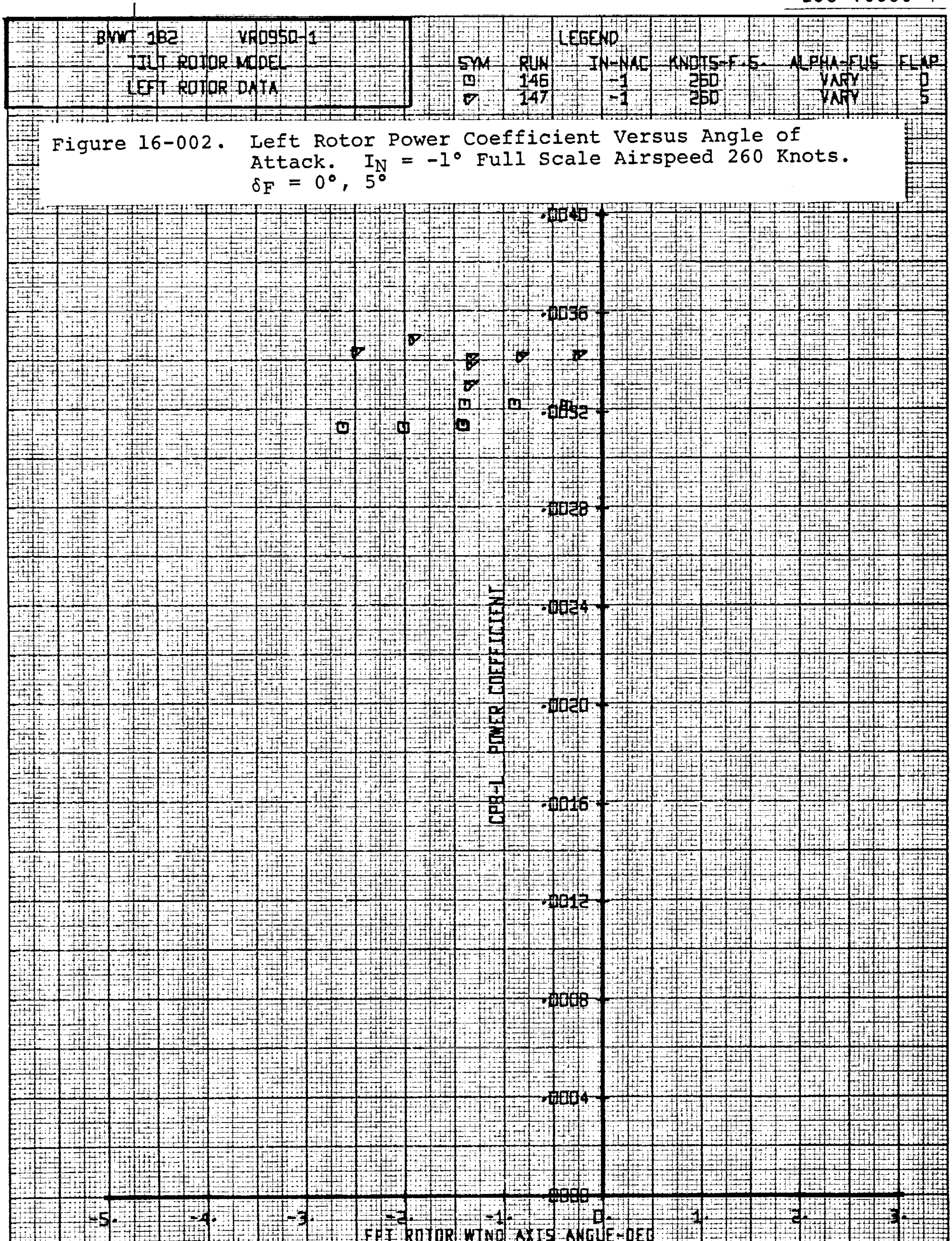


Figure 16-002. Left Rotor Power Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 260 Knots. $\delta_F = 0°, 5°$

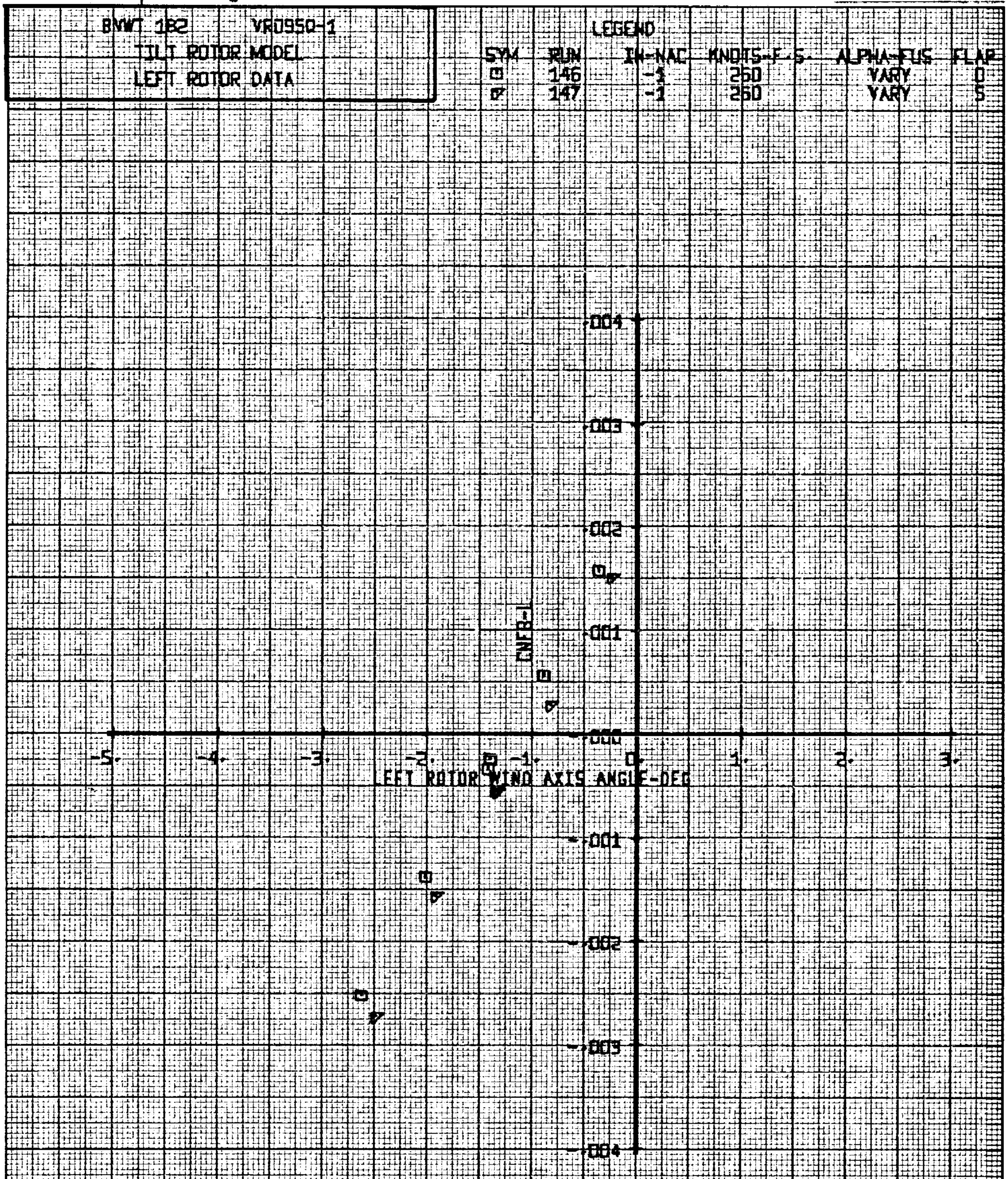


Figure 16-003. Left Rotor Normal Force Coefficient Versus Angle of Attack. I_N = -1° Full Scale Airspeed 260 Knots. δ_F = 0°, 5°

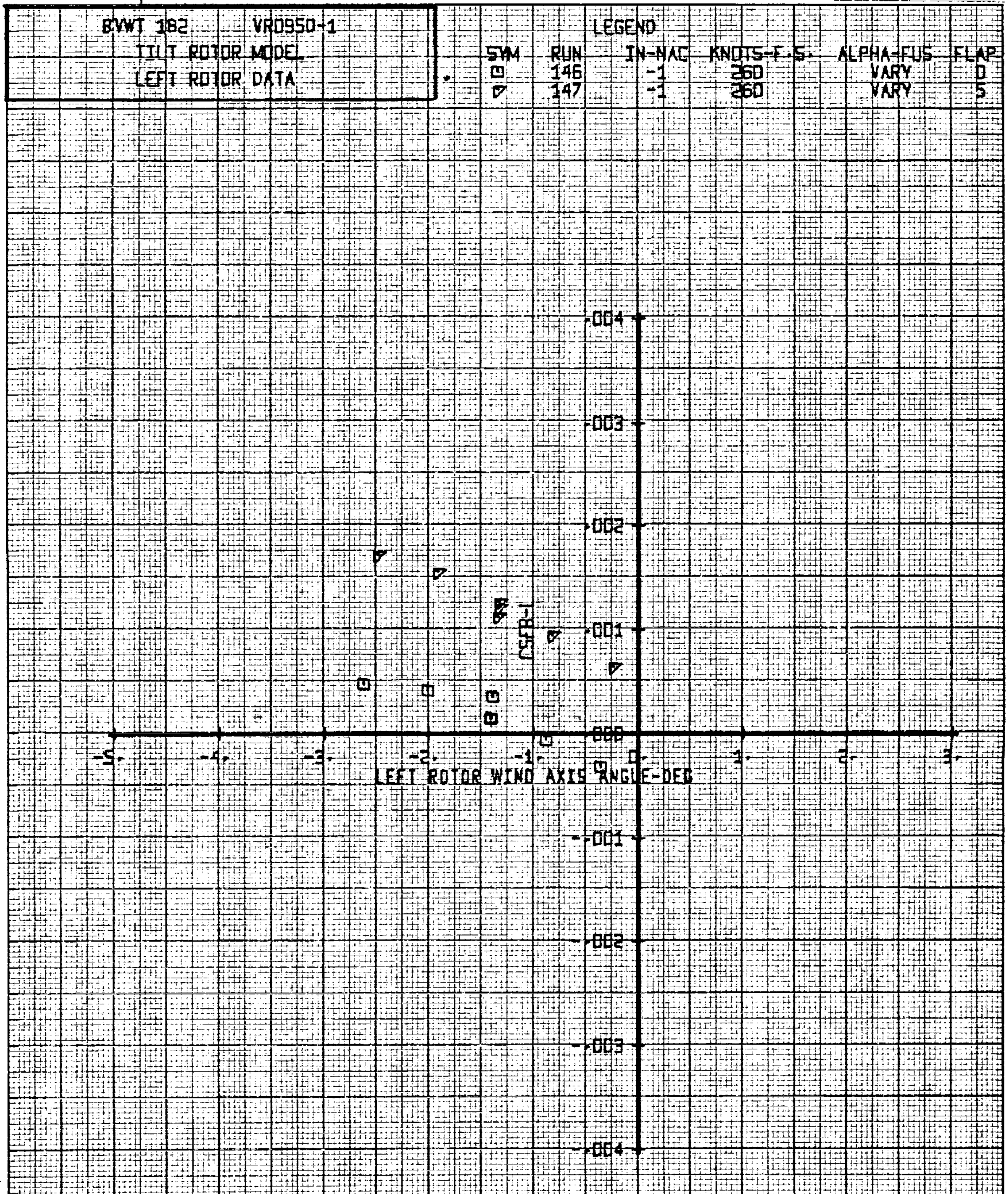


Figure 16-004. Left Rotor Side Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 260 Knots. $\delta_F = 0°, 5°$

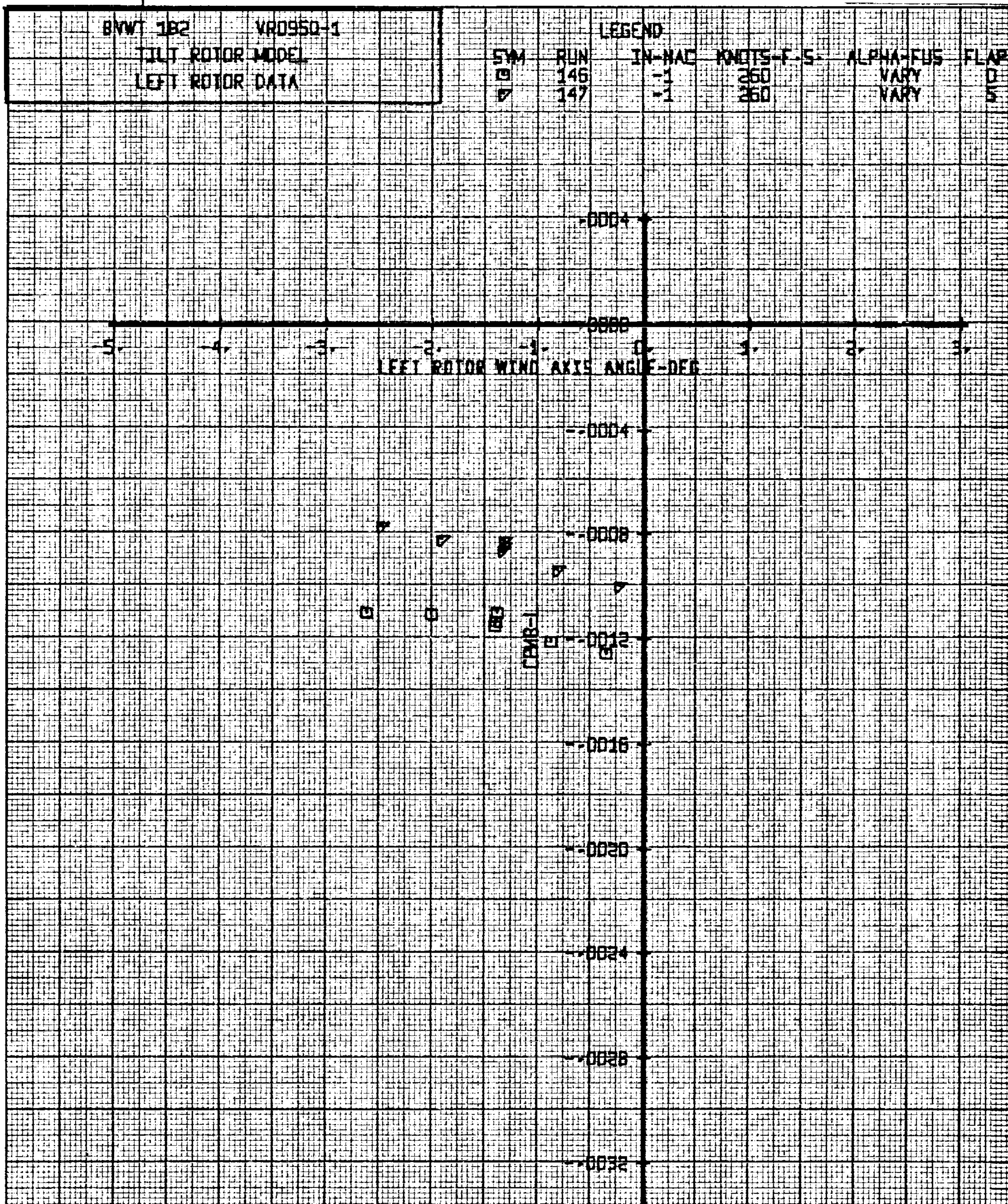


Figure 16-005. Left Rotor Pitching Moment Versus Angle of Attack.
$I_N = -1°$ Full Scale Airspeed 260 Knots.
$\delta_F = 0°, 5°$

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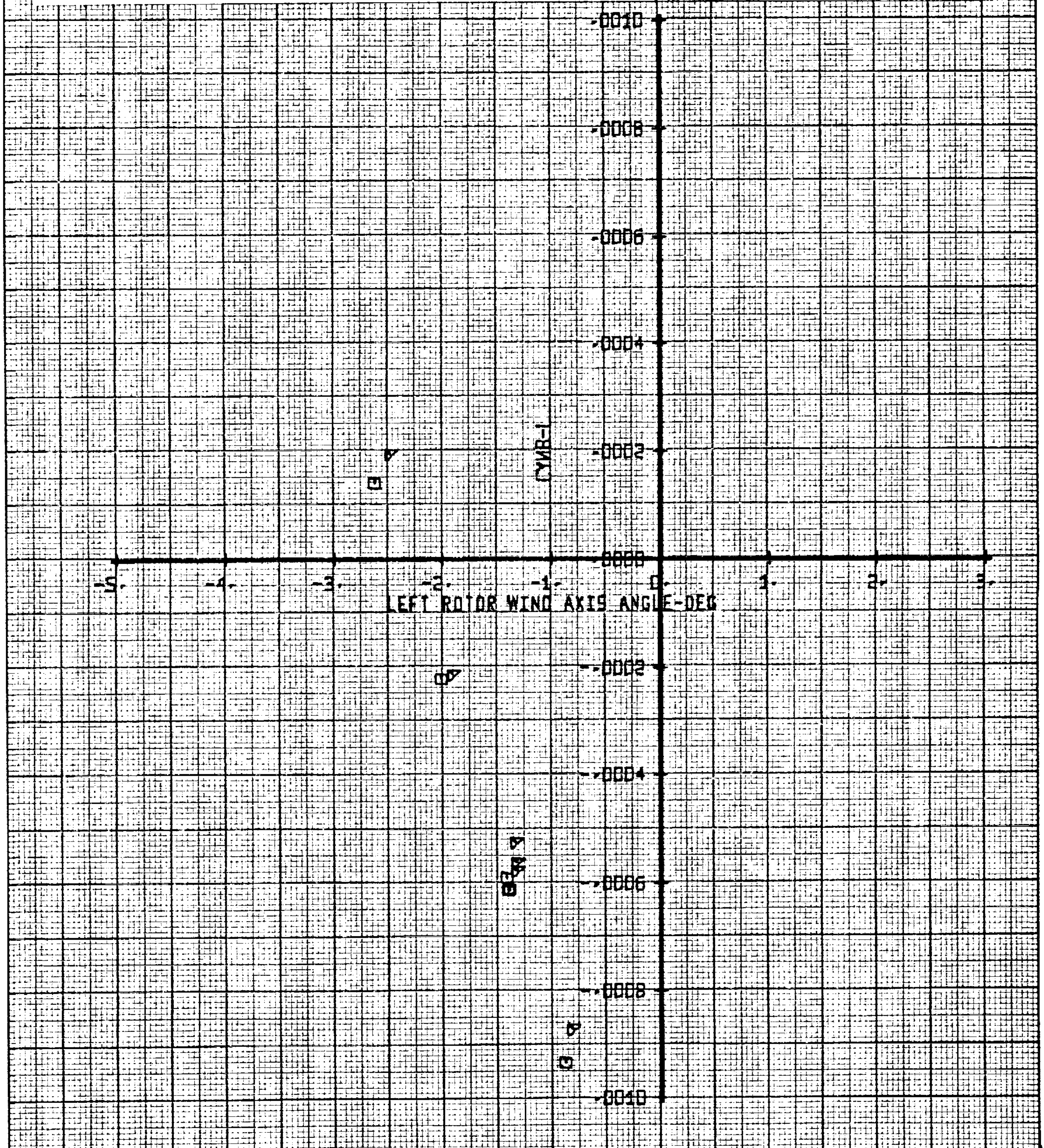
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	146	-1	260	VARY	0
▽	147	-1	260	VARY	5

Figure 16-006. Left Rotor Yawing Moment Versus Angle of Attack. I_N = -1° Full Scale Airspeed 260 Knots. δ_F = 0°, 5°



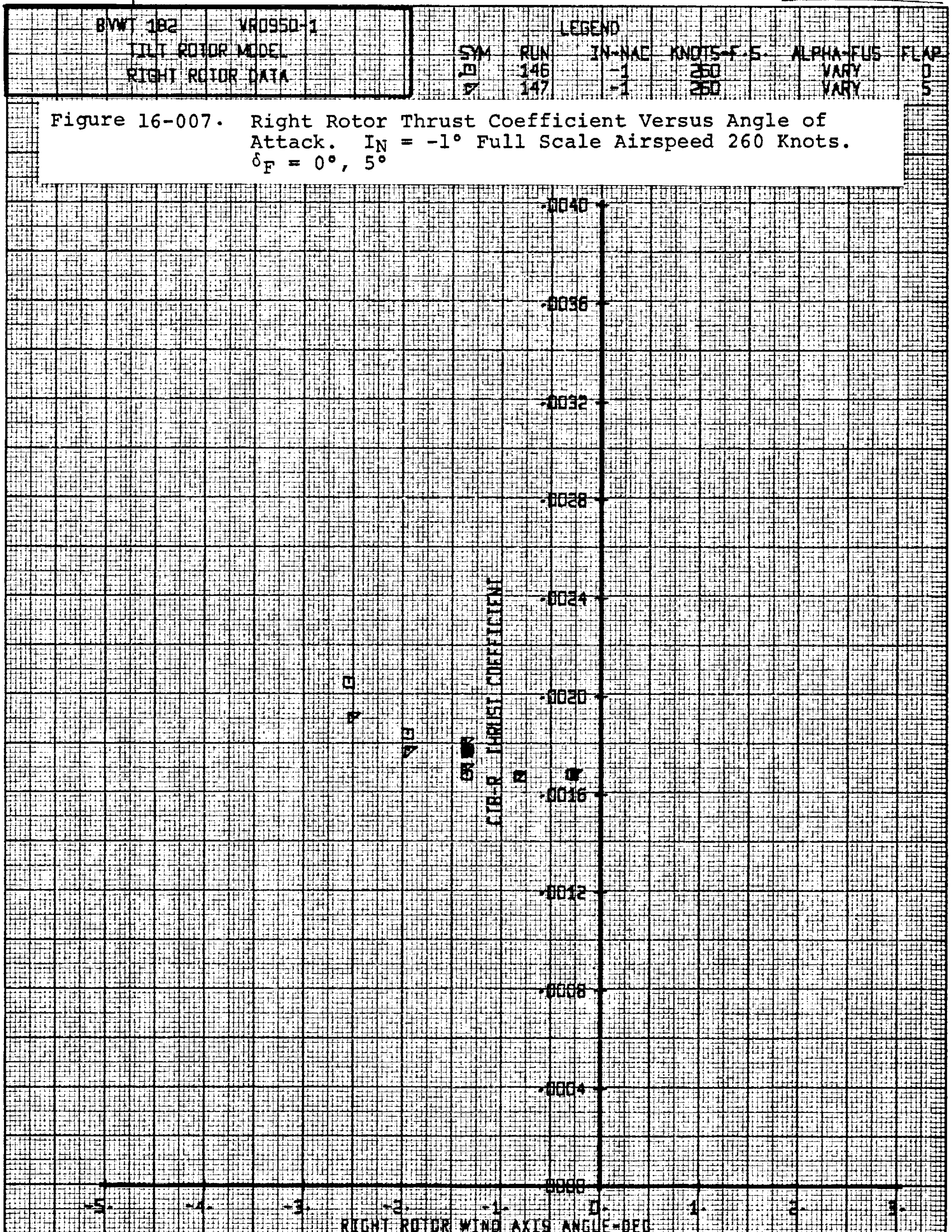
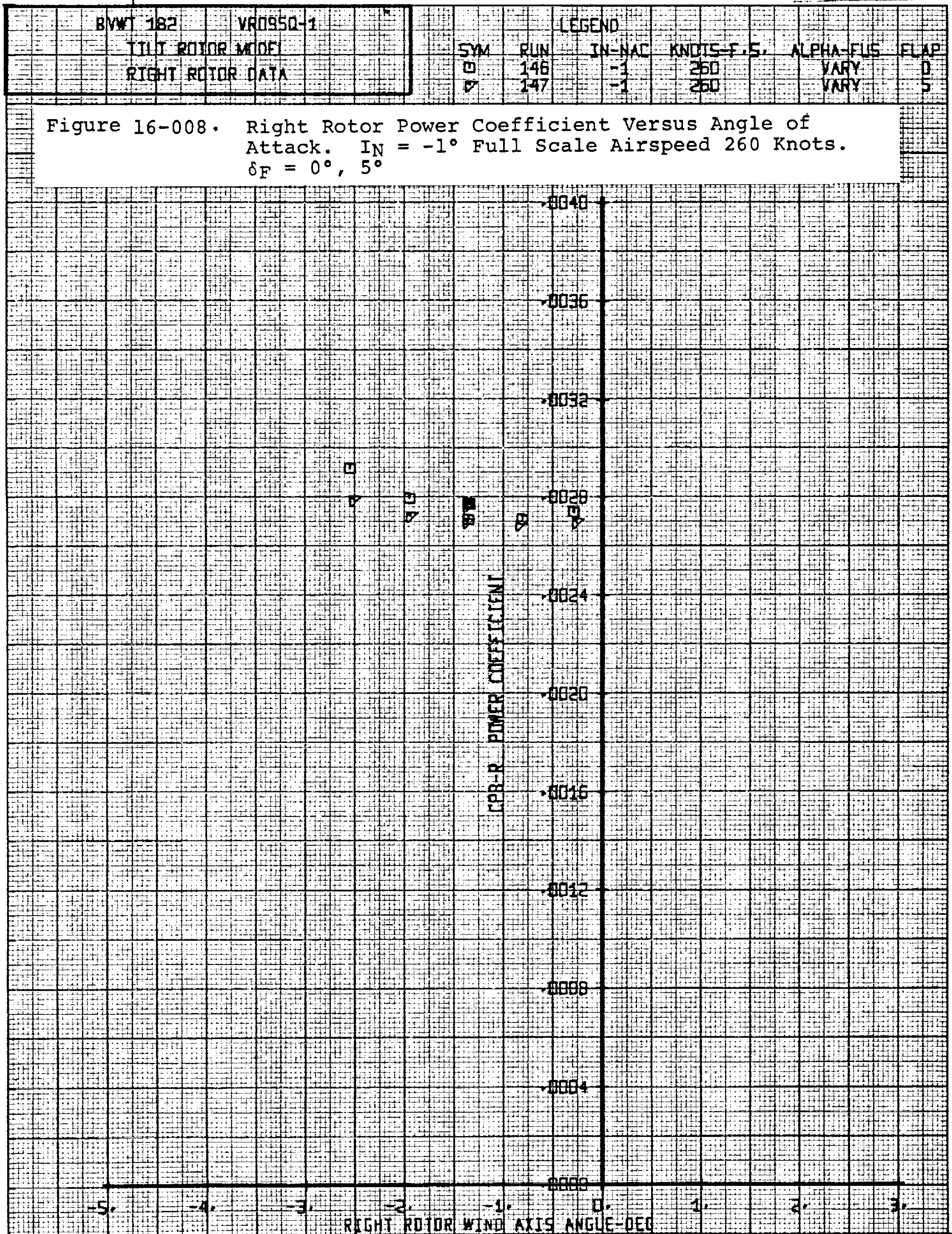


Figure 16-007. Right Rotor Thrust Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 260 Knots. $\delta_F = 0°, 5°$

Figure 16-008. Right Rotor Power Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 260 Knots. $\delta_F = 0°, 5°$



98
182

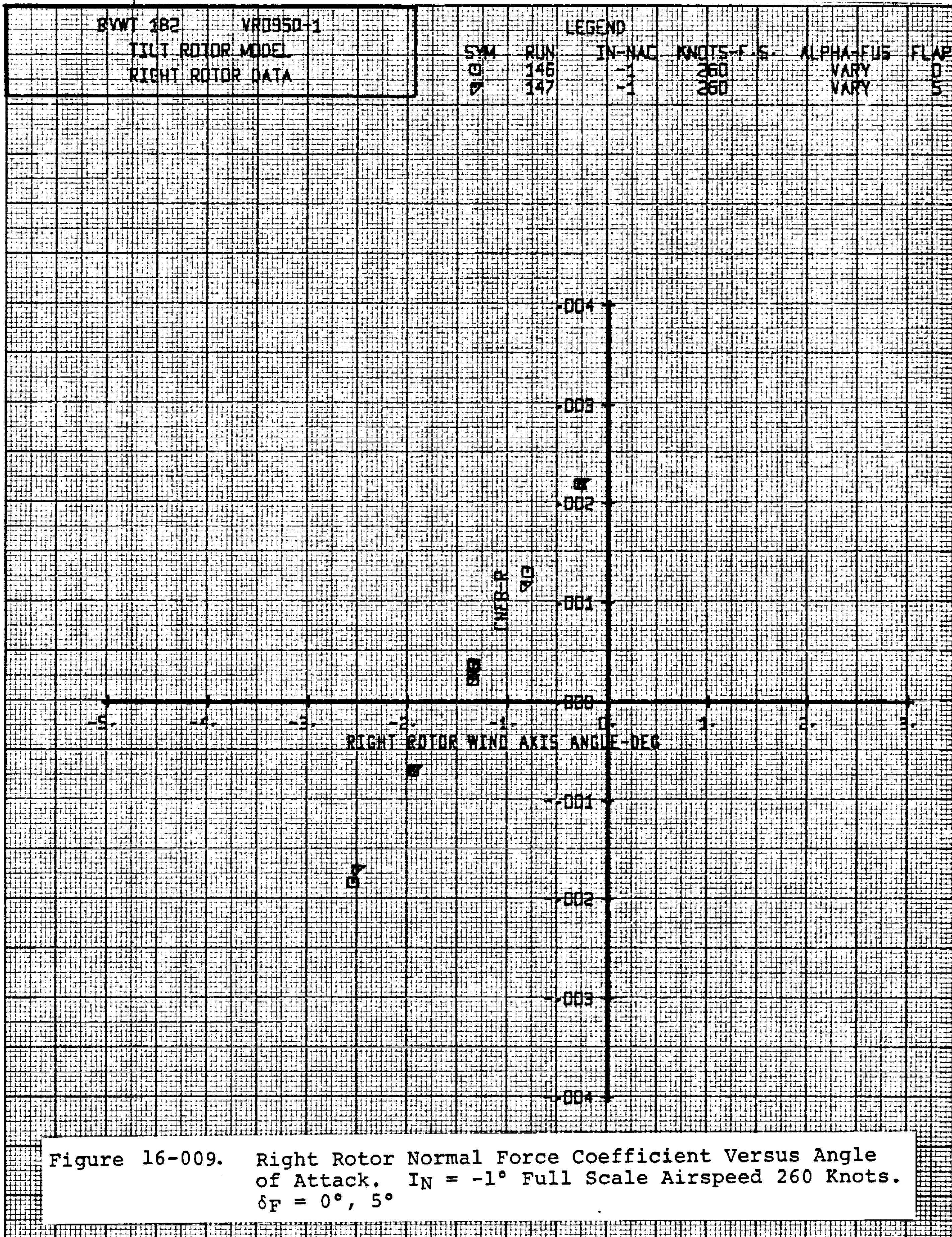


Figure 16-009. Right Rotor Normal Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 260 Knots. $\delta_F = 0°, 5°$

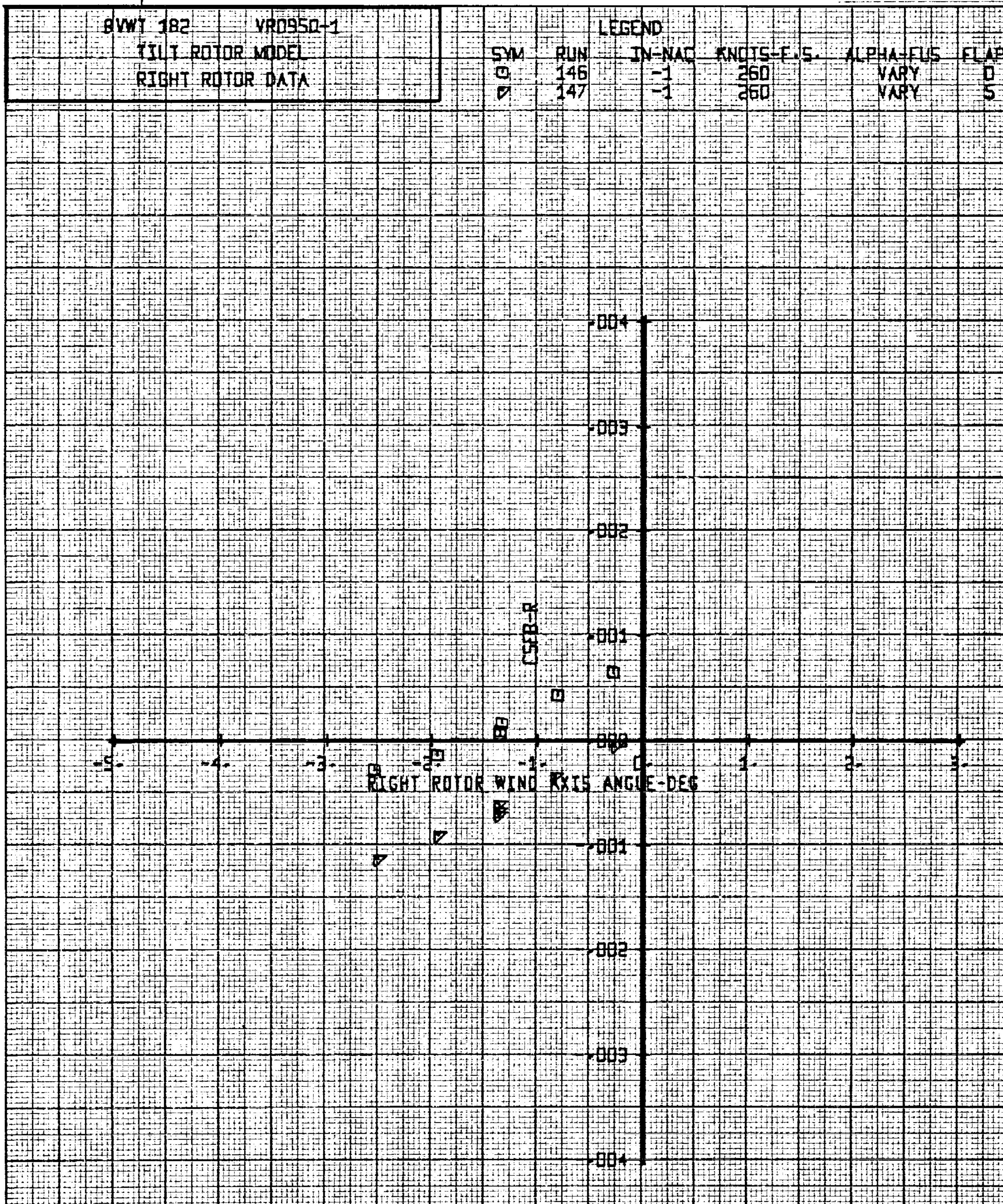


Figure 16-010. Right Rotor Side Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 260 Knots. $\delta_F = 0°, 5°$

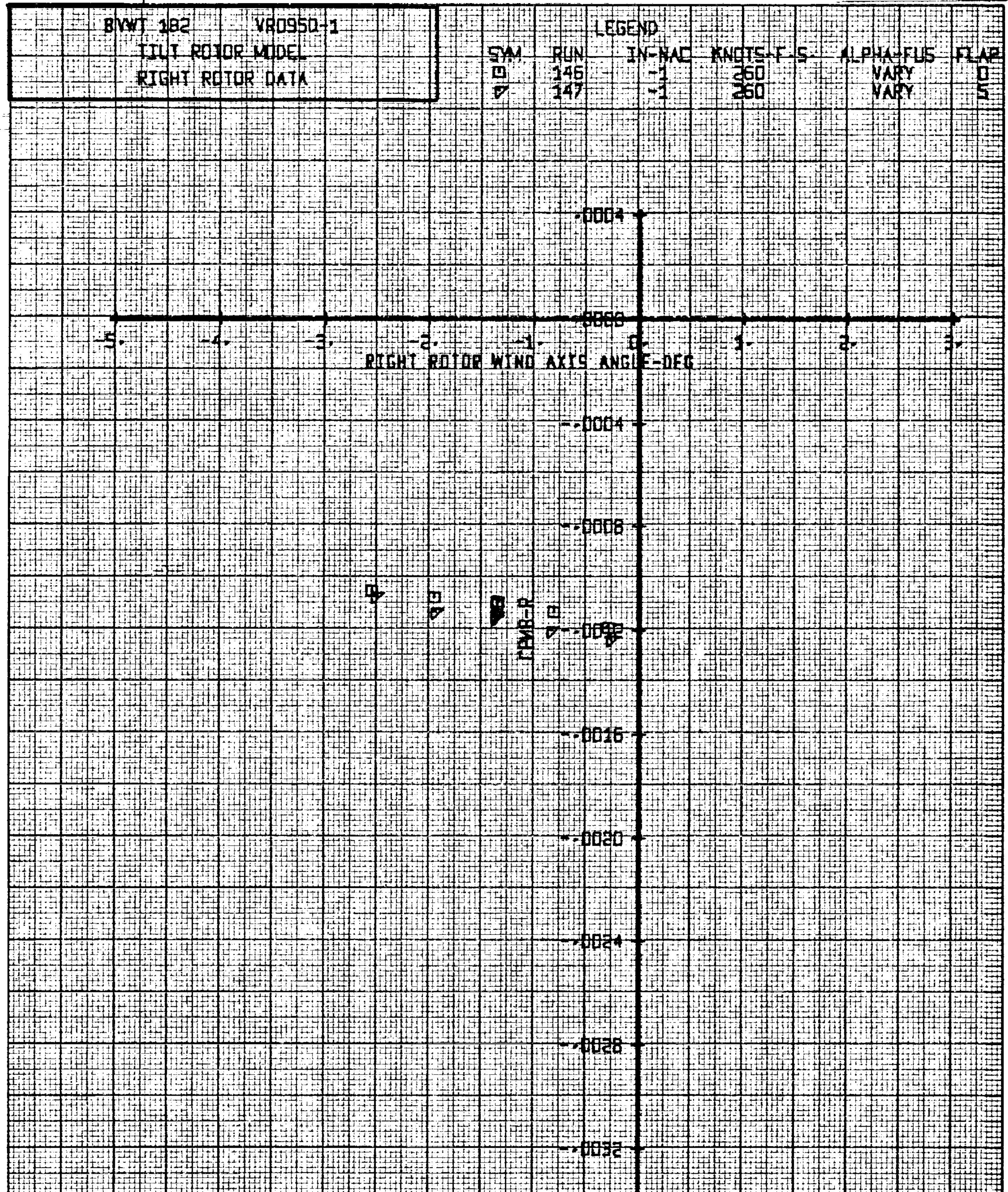


Figure 16-011. Right Rotor Pitching Moment Versus Angle of Attack.
$I_N = -1°$ Full Scale Airspeed 260 Knots.
$\delta_F = 0°, 5°$

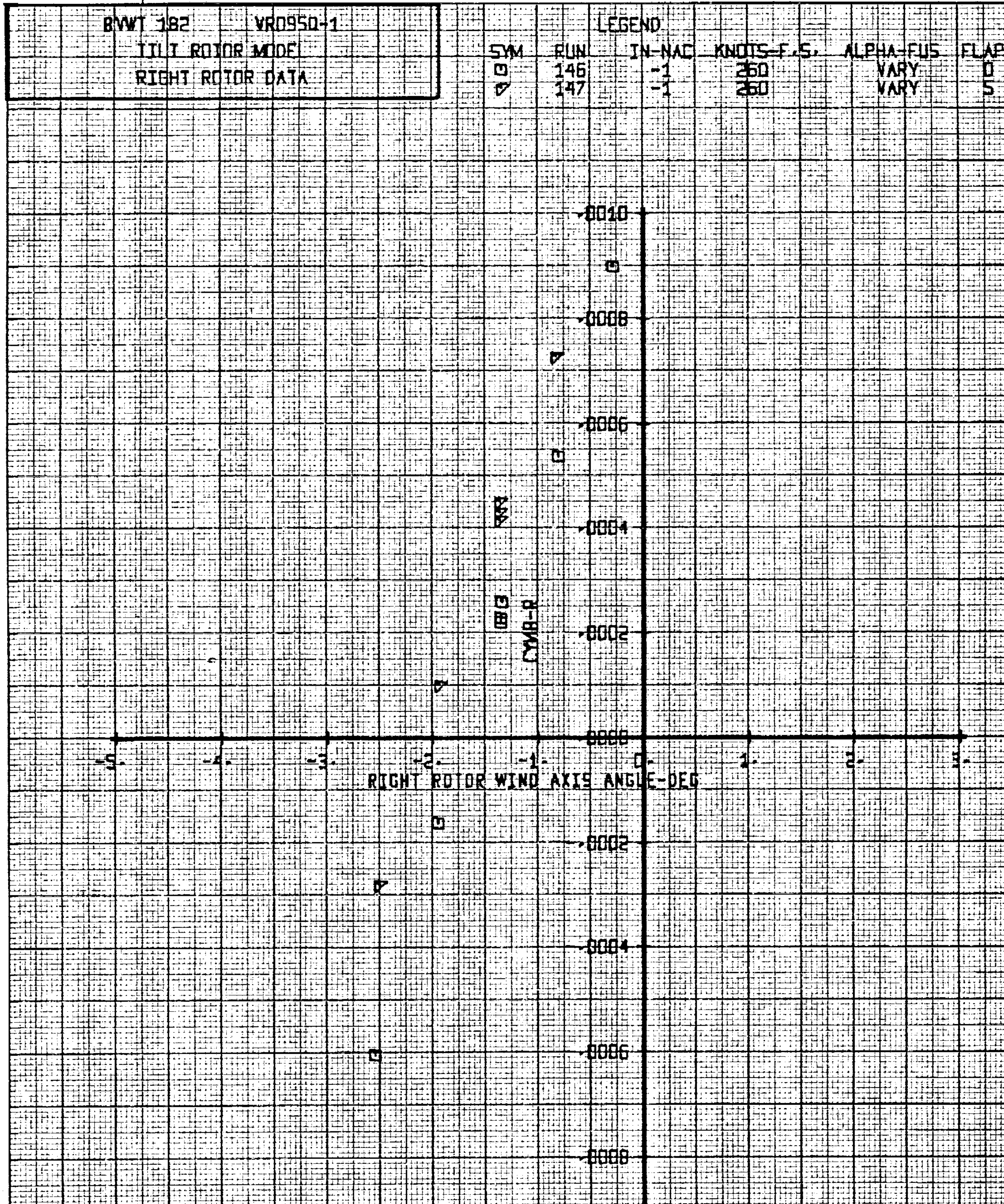


Figure 16-012. Right Rotor Yawing Moment Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 260 Knots. $\delta_F = 0°, 5°$

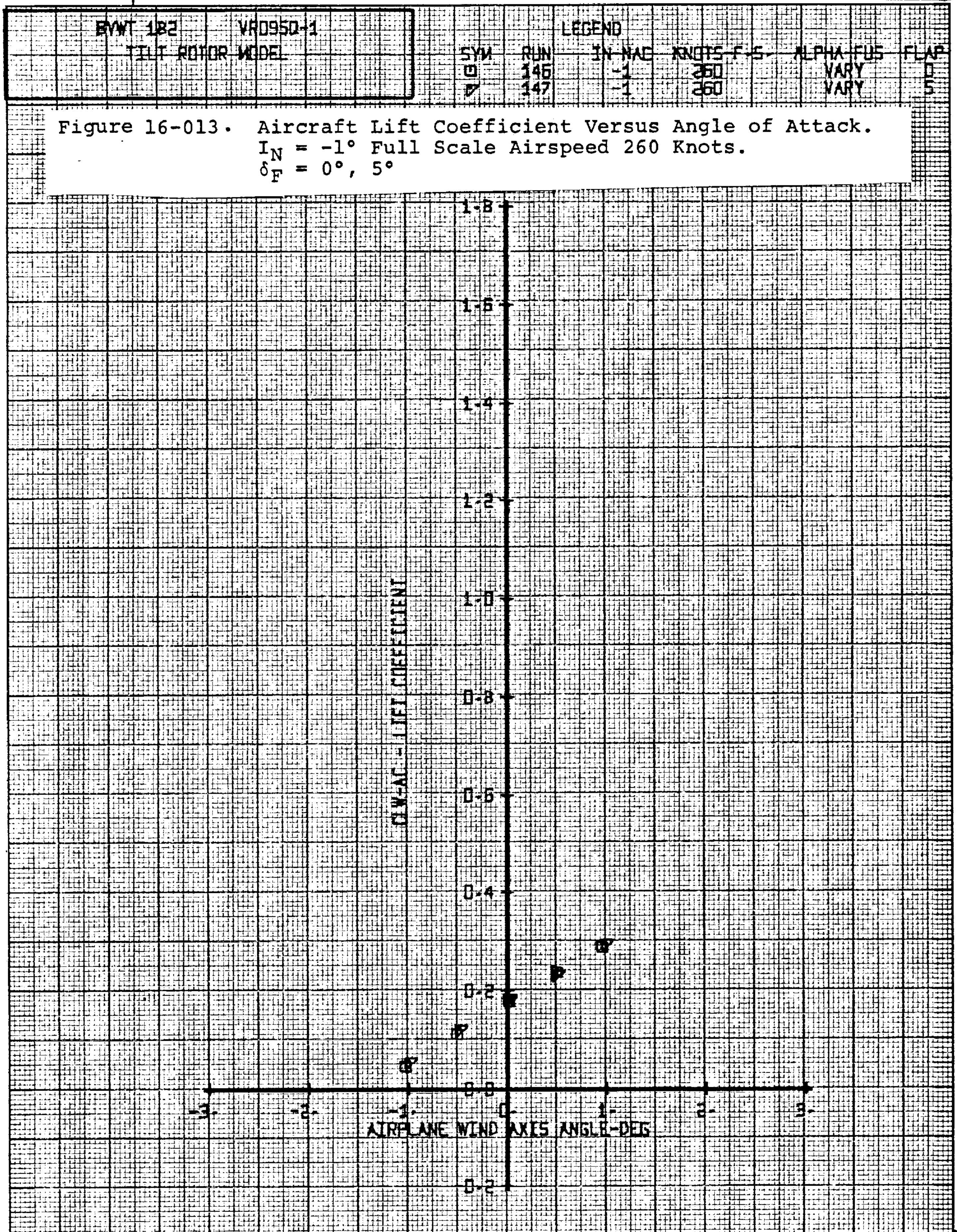


Figure 16-013. Aircraft Lift Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 260 Knots. $\delta_F = 0°, 5°$

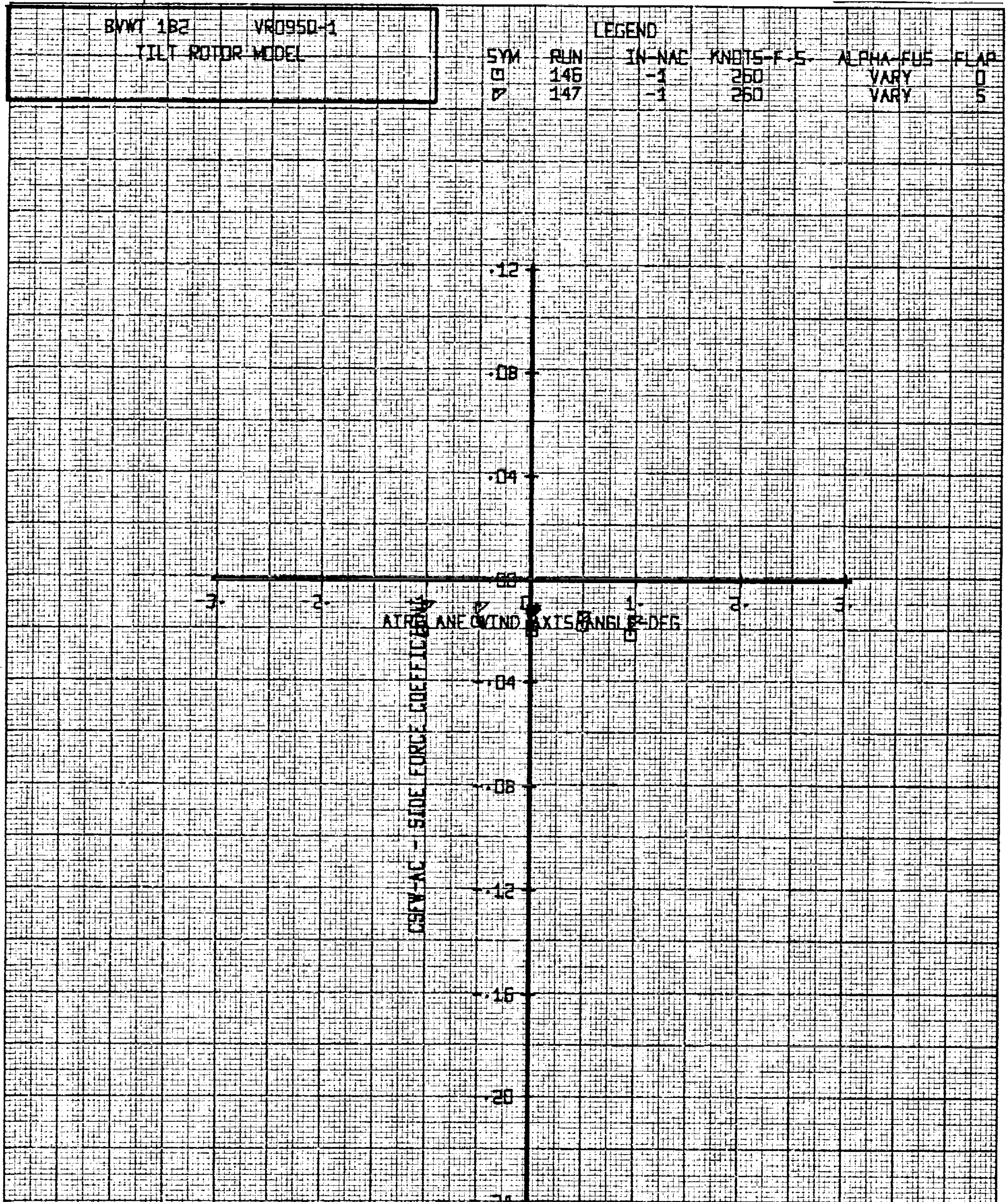


Figure 16-014. Aircraft Side Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 260 Knots. $\delta F = 0°, 5°$

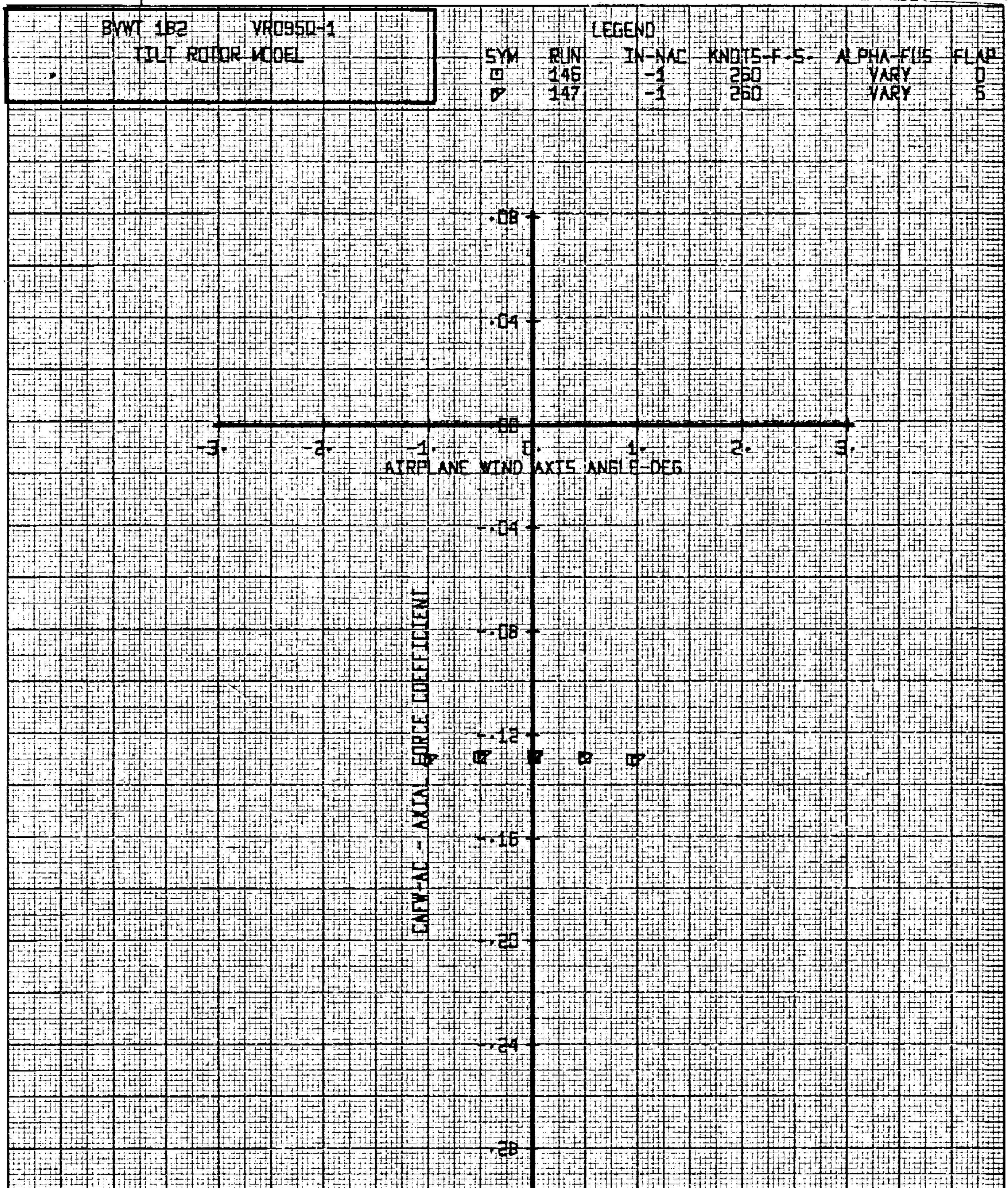


Figure 16-015. Aircraft Axial Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 260 Knots. $\delta_F = 0°, 5°$

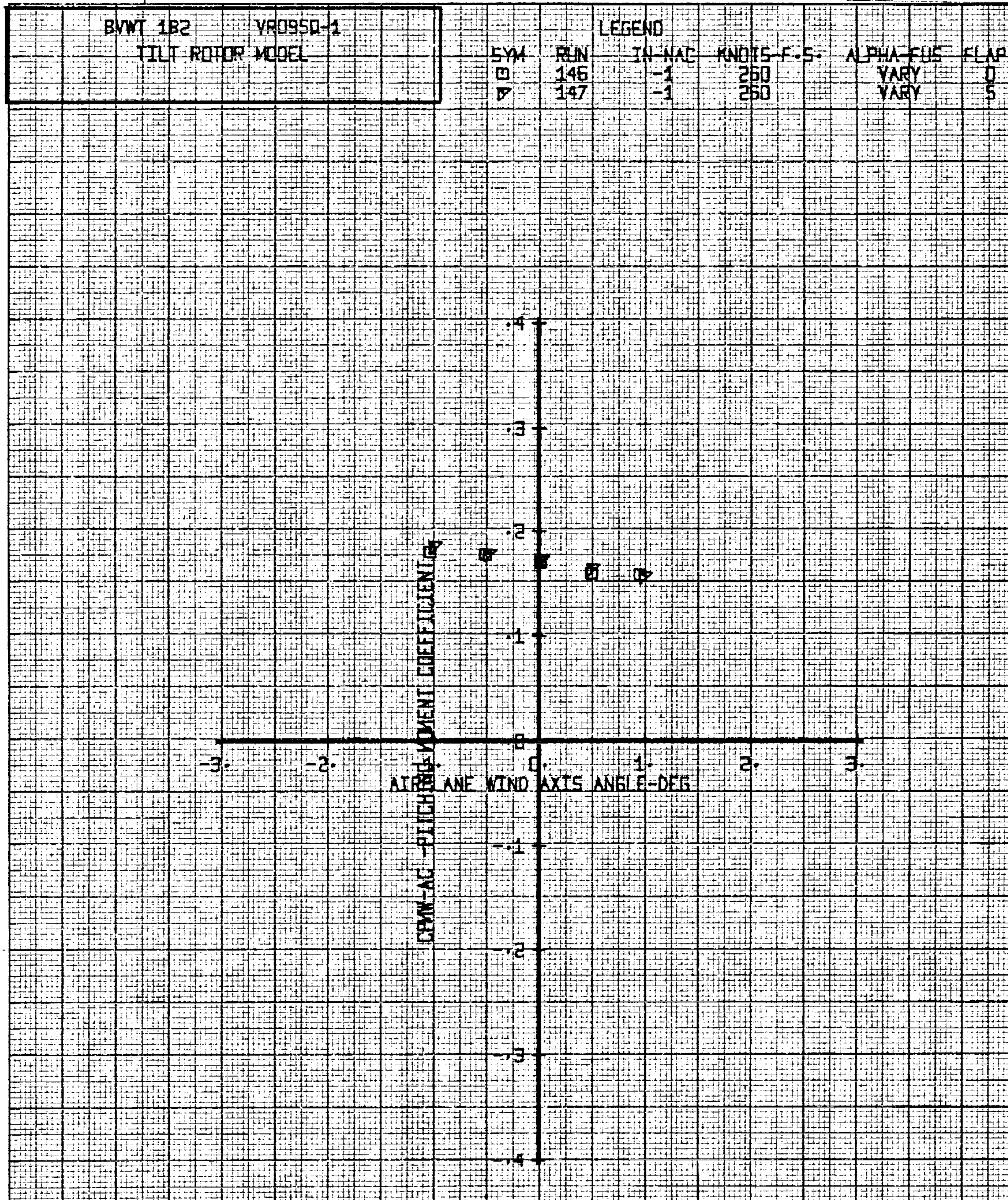


Figure 16-016. Aircraft Pitching Moment Versus Angle of Attack.
$I_N = -1°$ Full Scale Airspeed 260 Knots.
$\delta_F = 0°, 5°$

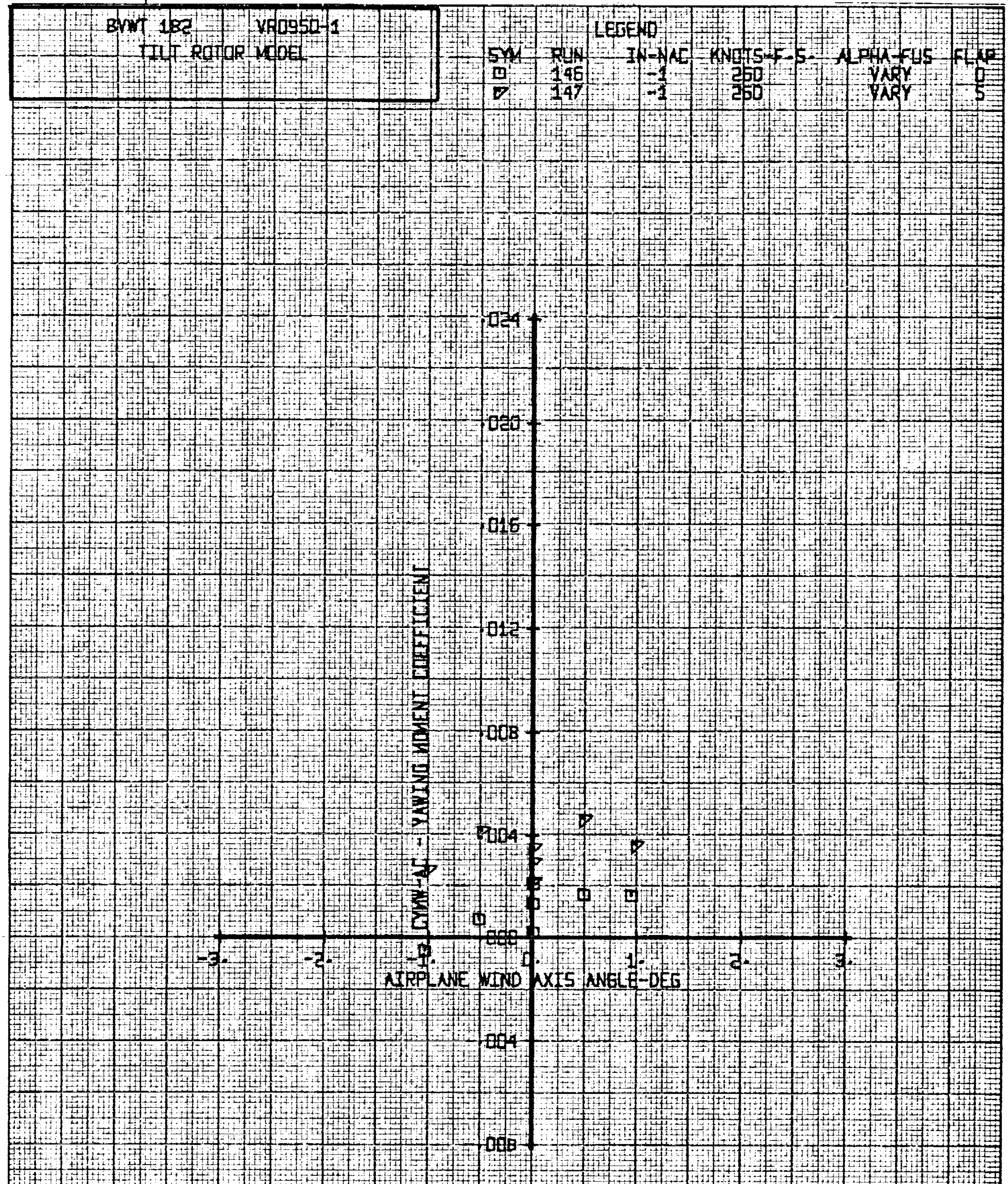


Figure 16-017. Aircraft Yawing Moment Versus Angle of Attack.
$I_N = -1°$ Full Scale Airspeed 260 Knots.
$\delta_F = 0°, 5°$

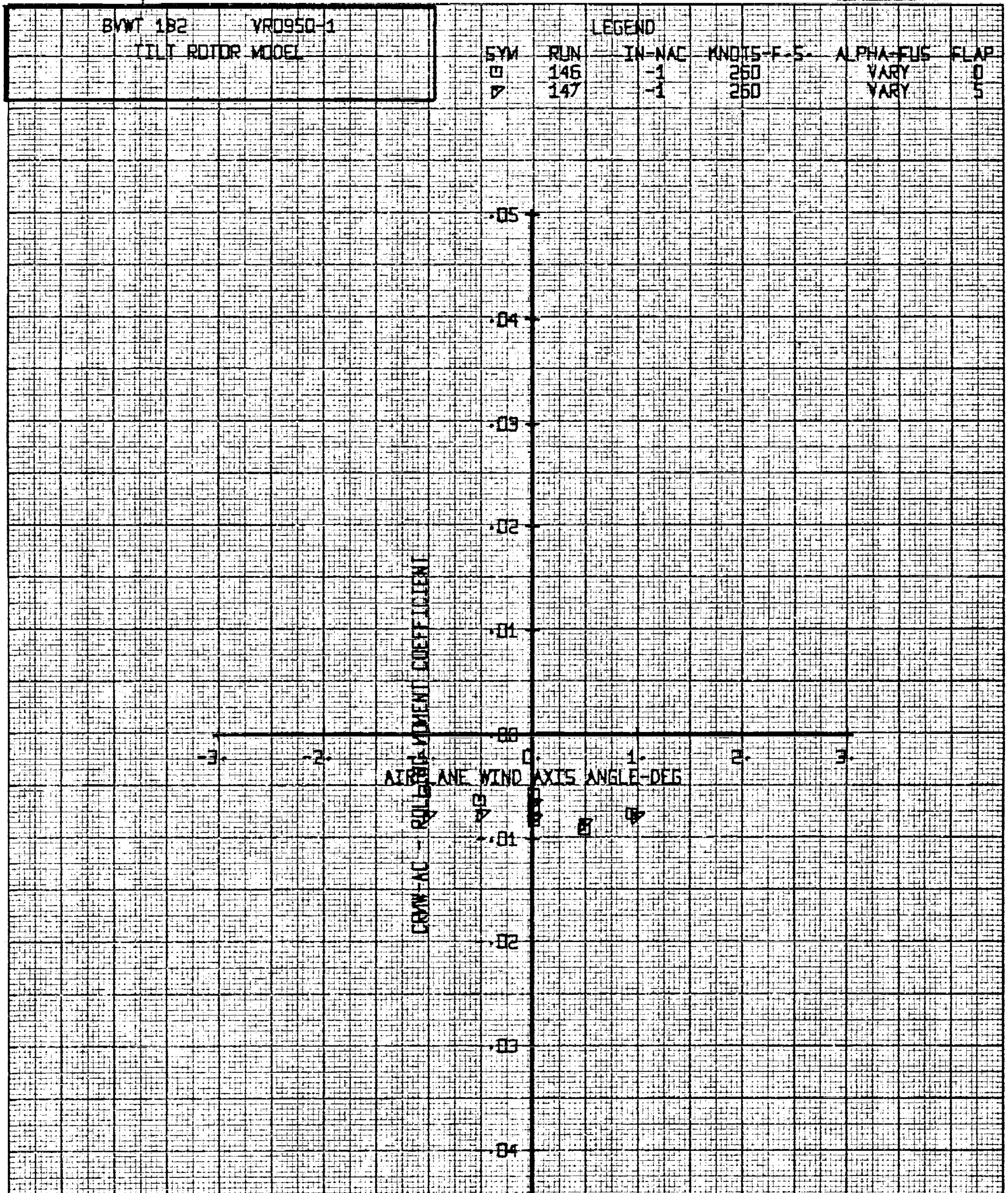


Figure 16-018. Aircraft Rolling Moment Versus Angle of Attack.
$I_N = -1°$ Full Scale Airspeed 260 Knots.
$\delta_F = 0°, 5°$

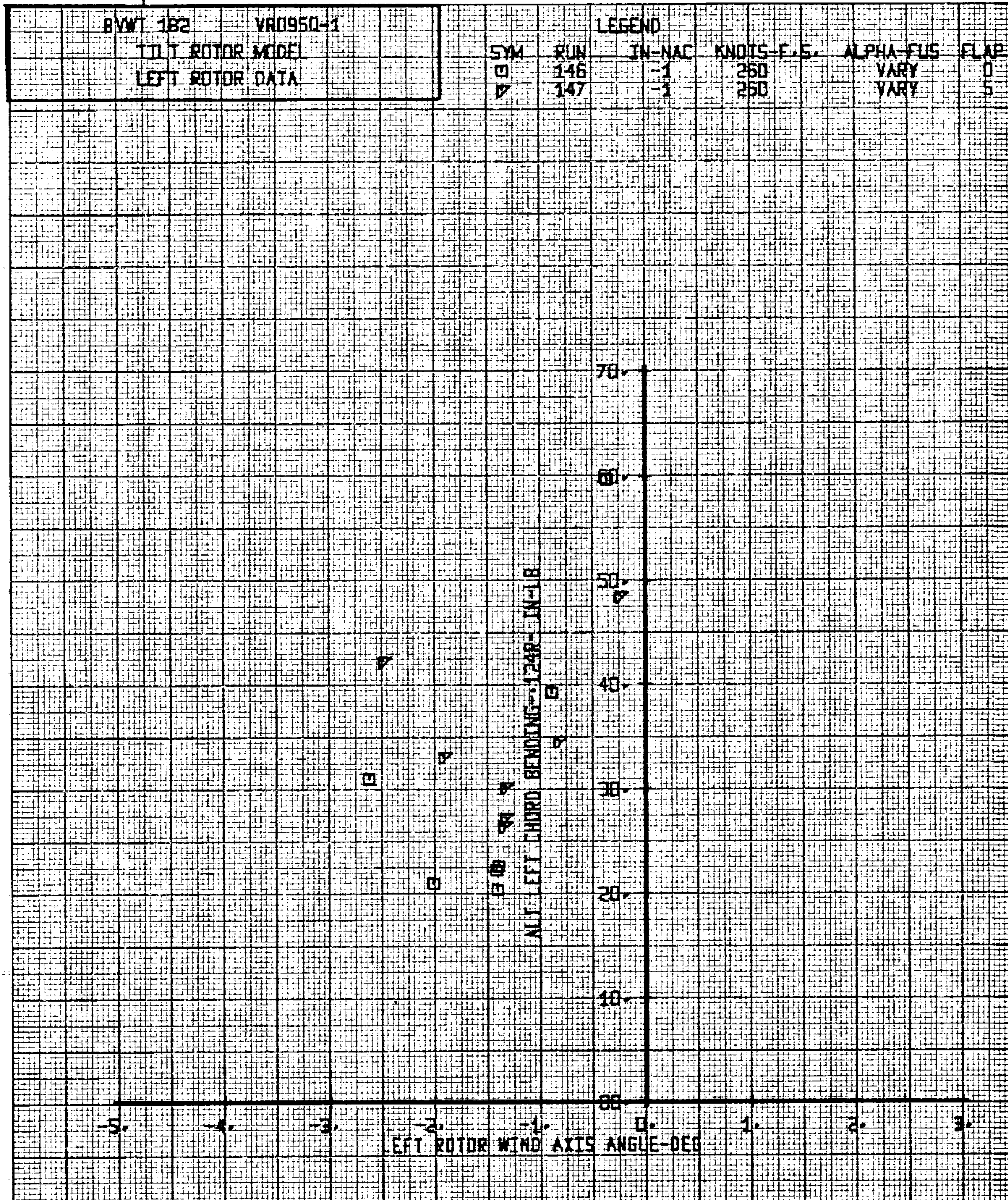


Figure 16-019. Alt. Left Chord Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 260 Knots. $\delta_F = 0°, 5°$

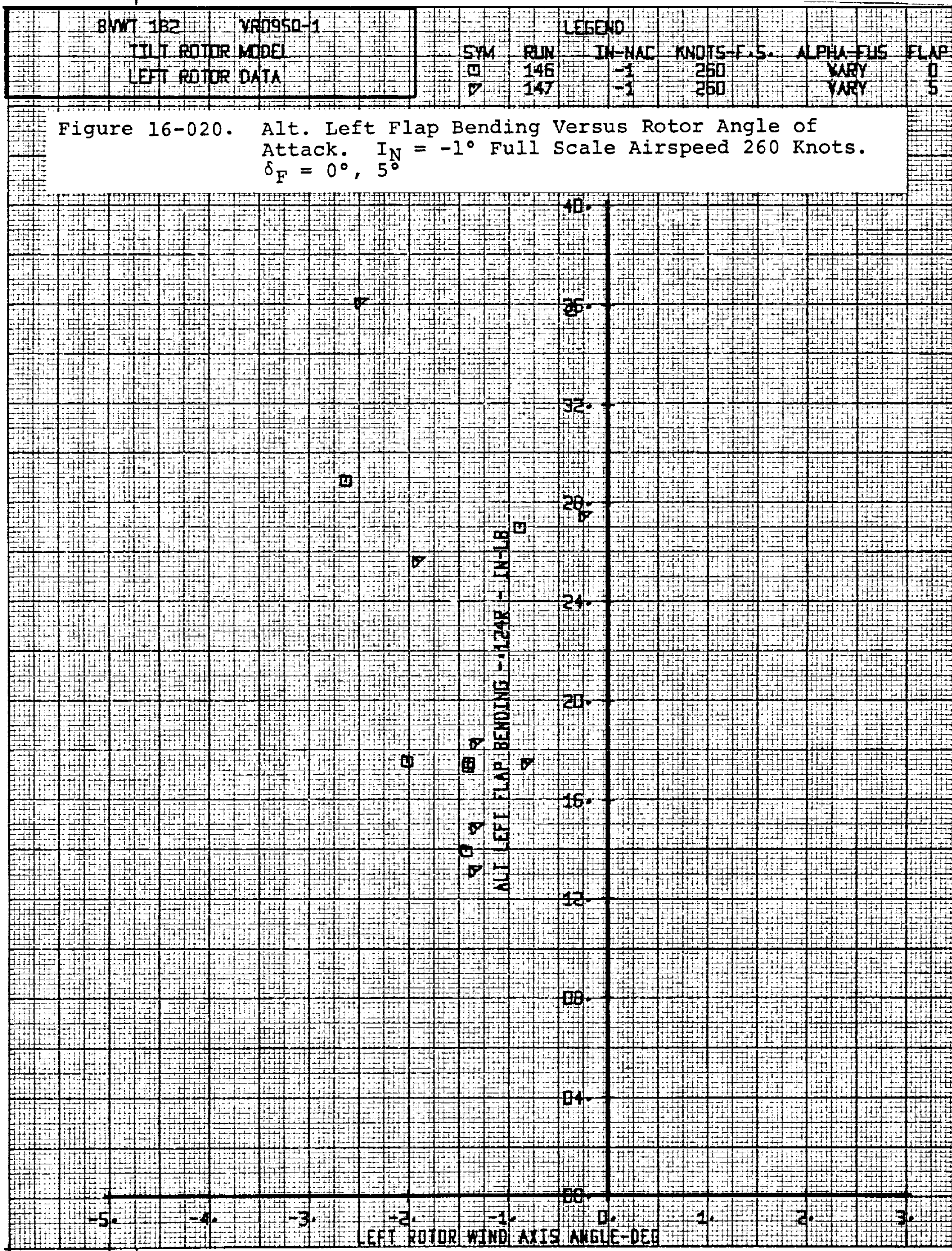


Figure 16-020. Alt. Left Flap Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 260 Knots. $\delta_F = 0°, 5°$

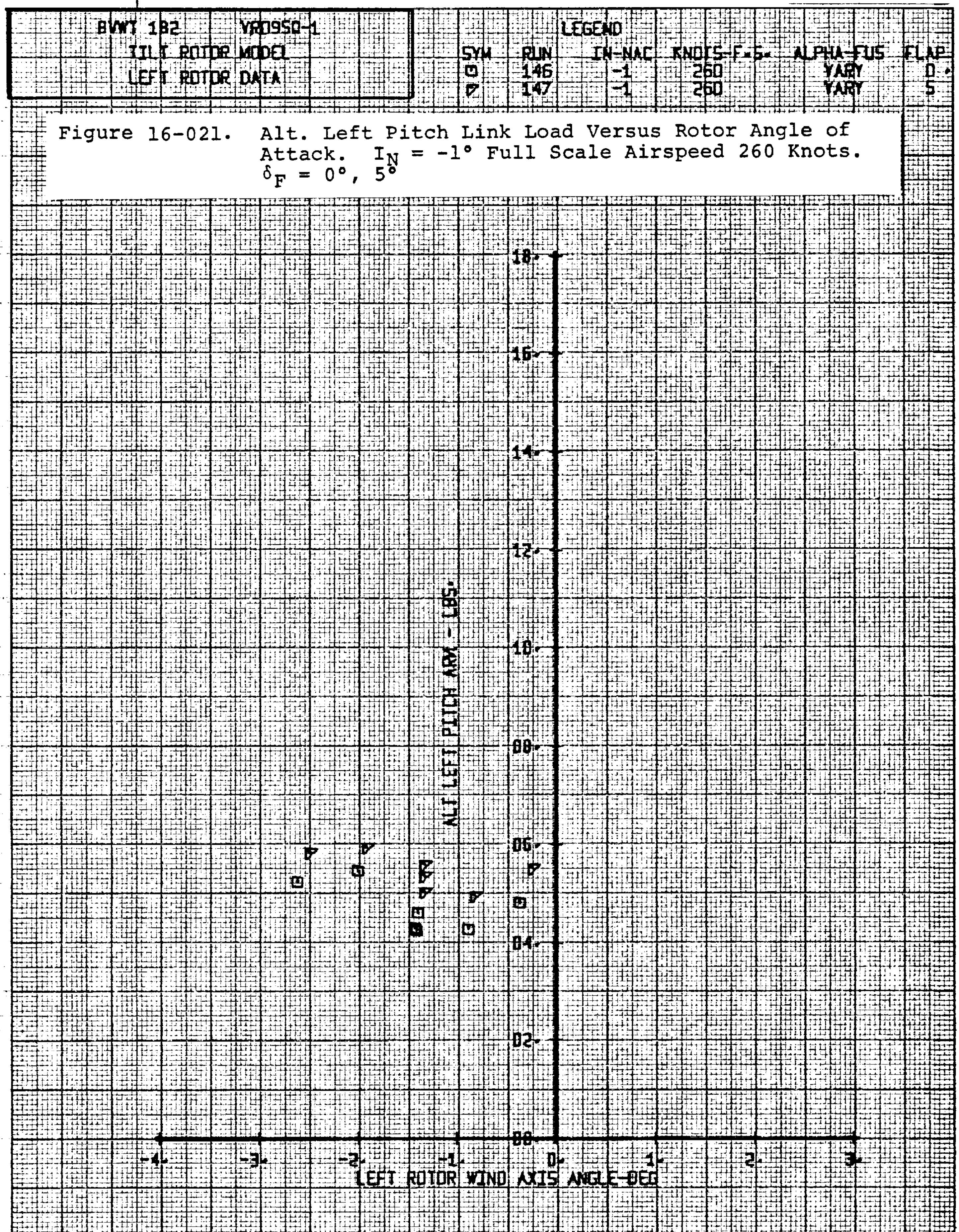


Figure 16-021. Alt. Left Pitch Link Load Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 260 Knots. $\delta_F = 0°, 5°$

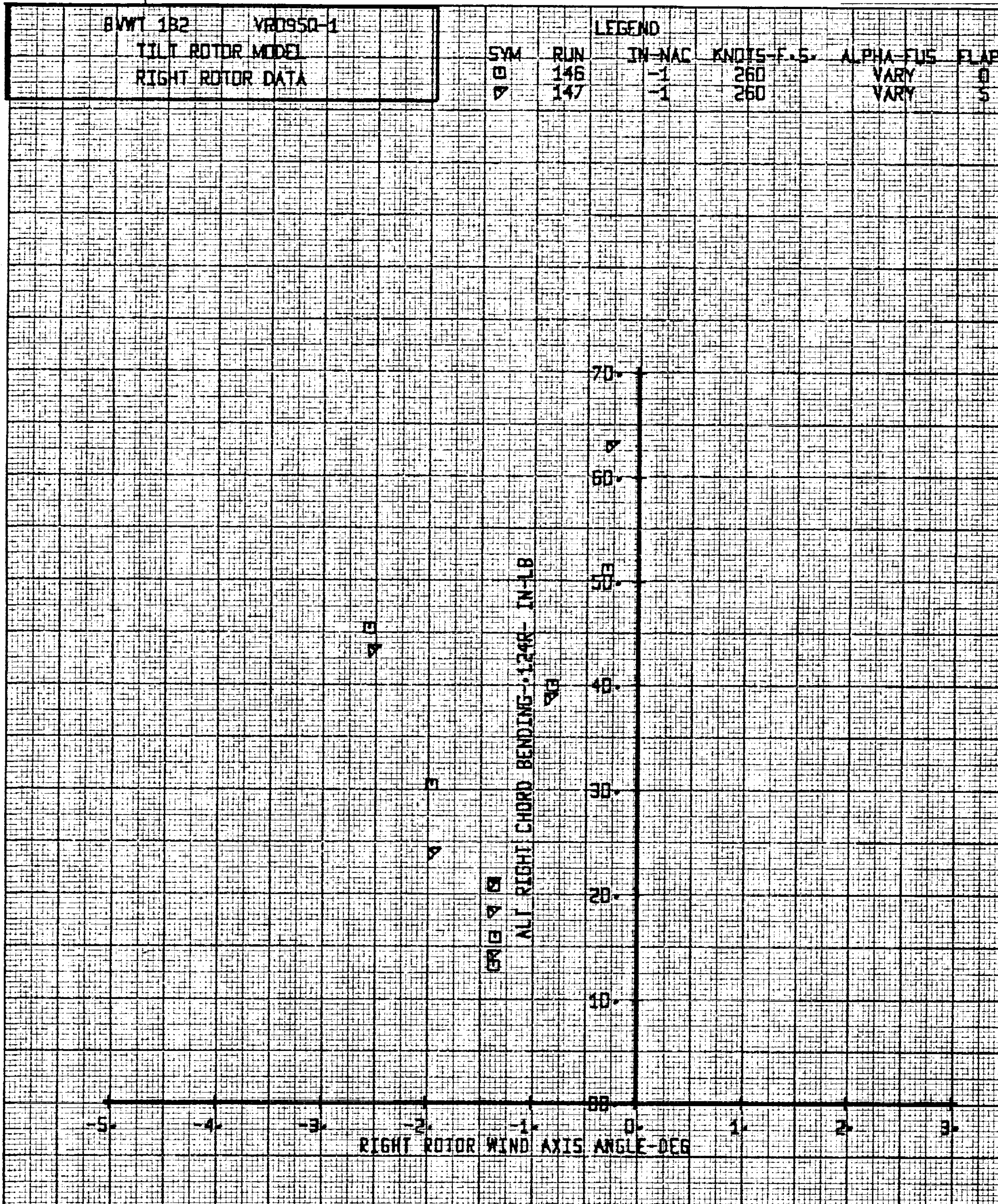


Figure 16-022. Alt. Right Chord Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 260 Knots. $\delta_F = 0°, 5°$

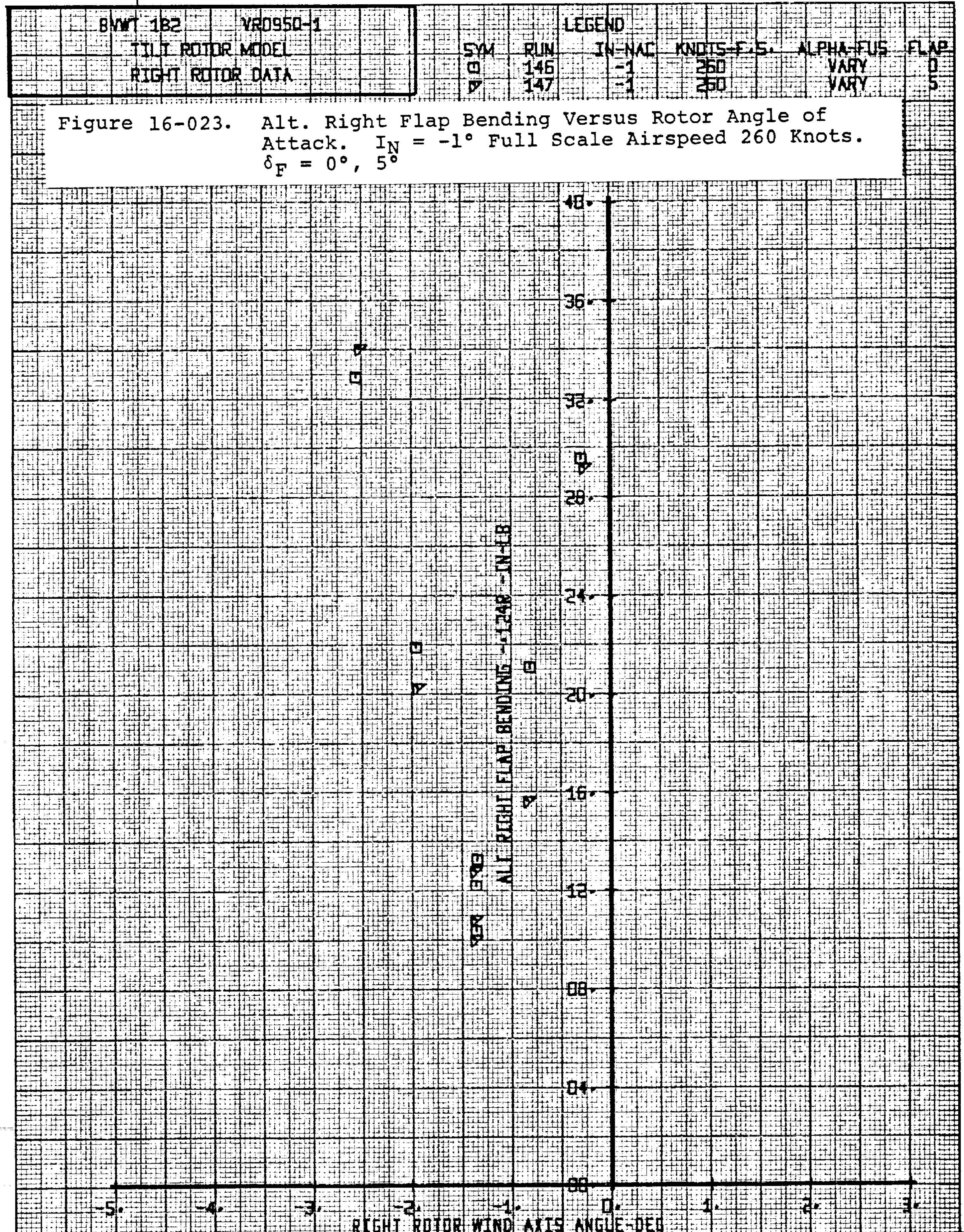


Figure 16-023. Alt. Right Flap Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 260 Knots. $\delta_F = 0°, 5°$

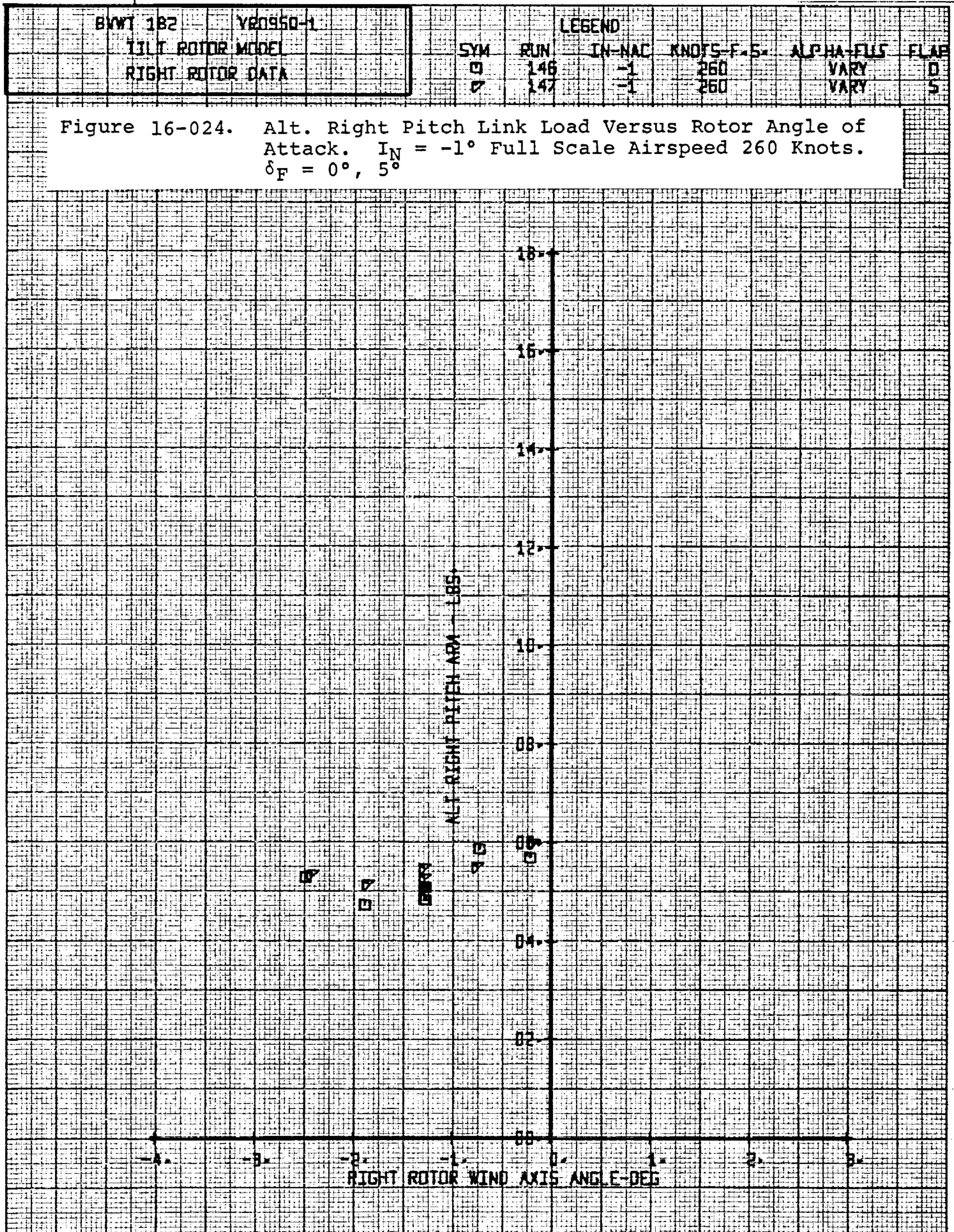
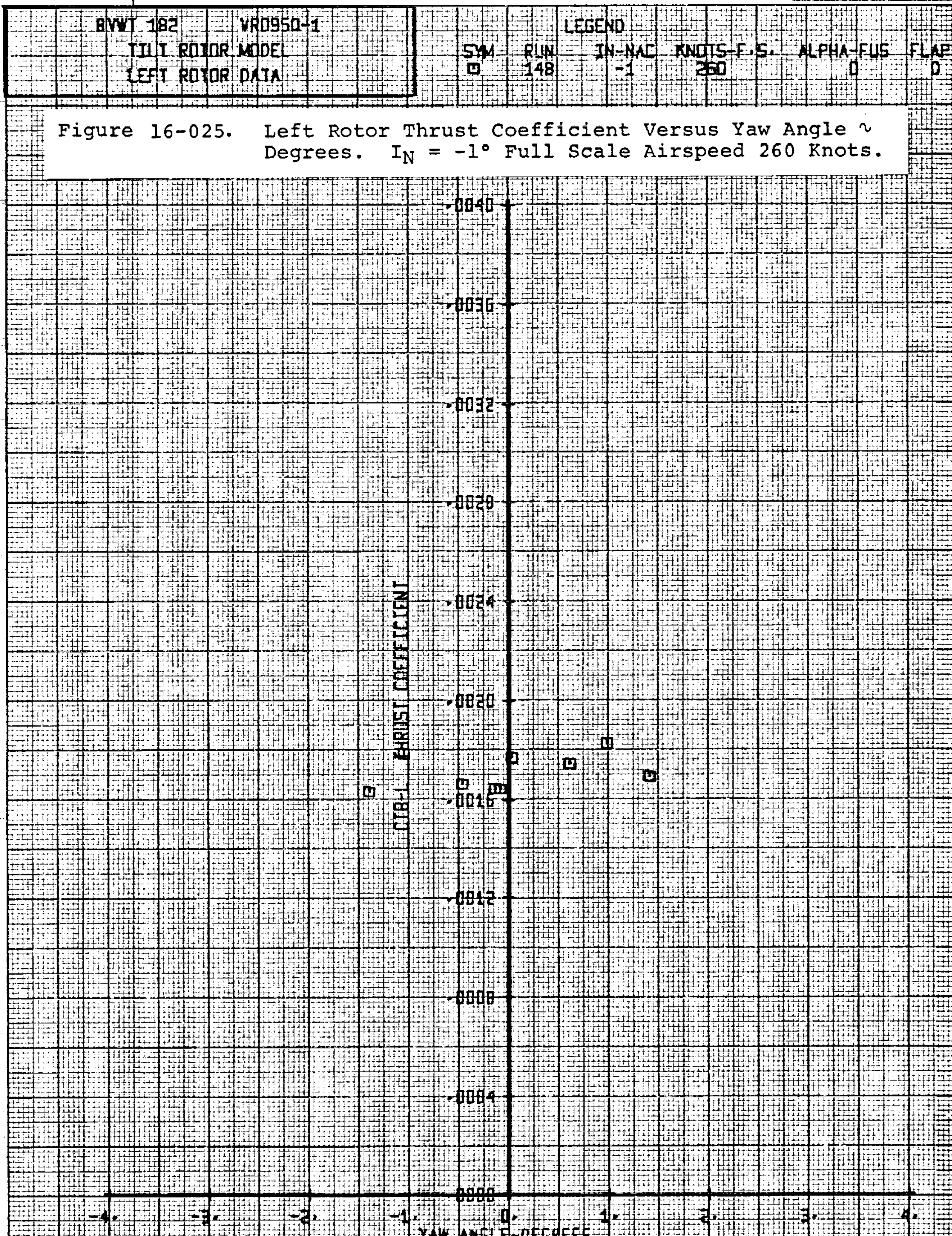


Figure 16-024. Alt. Right Pitch Link Load Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 260 Knots. $\delta_F = 0°, 5°$

Figure 16-025. Left Rotor Thrust Coefficient Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.



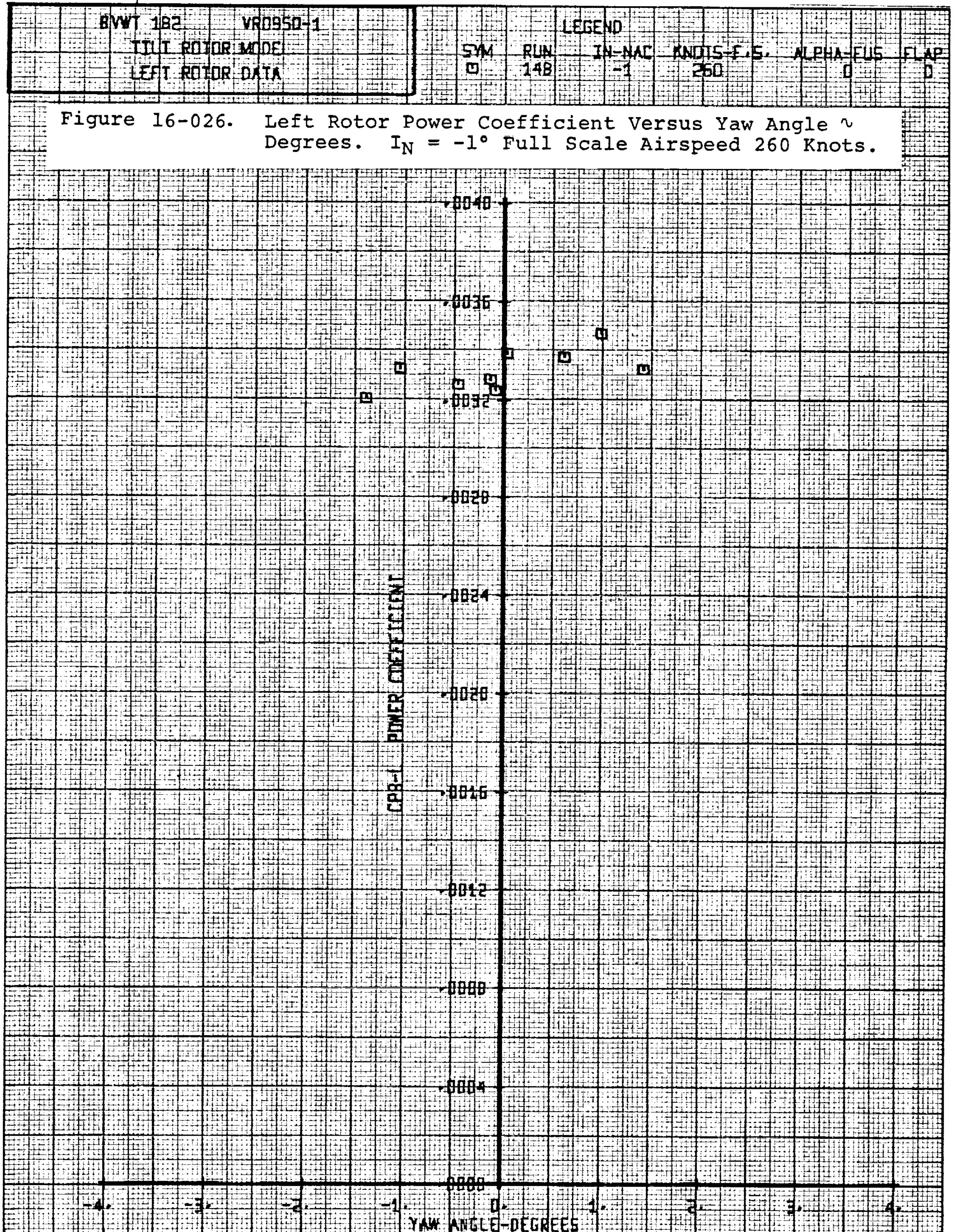


Figure 16-026. Left Rotor Power Coefficient Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

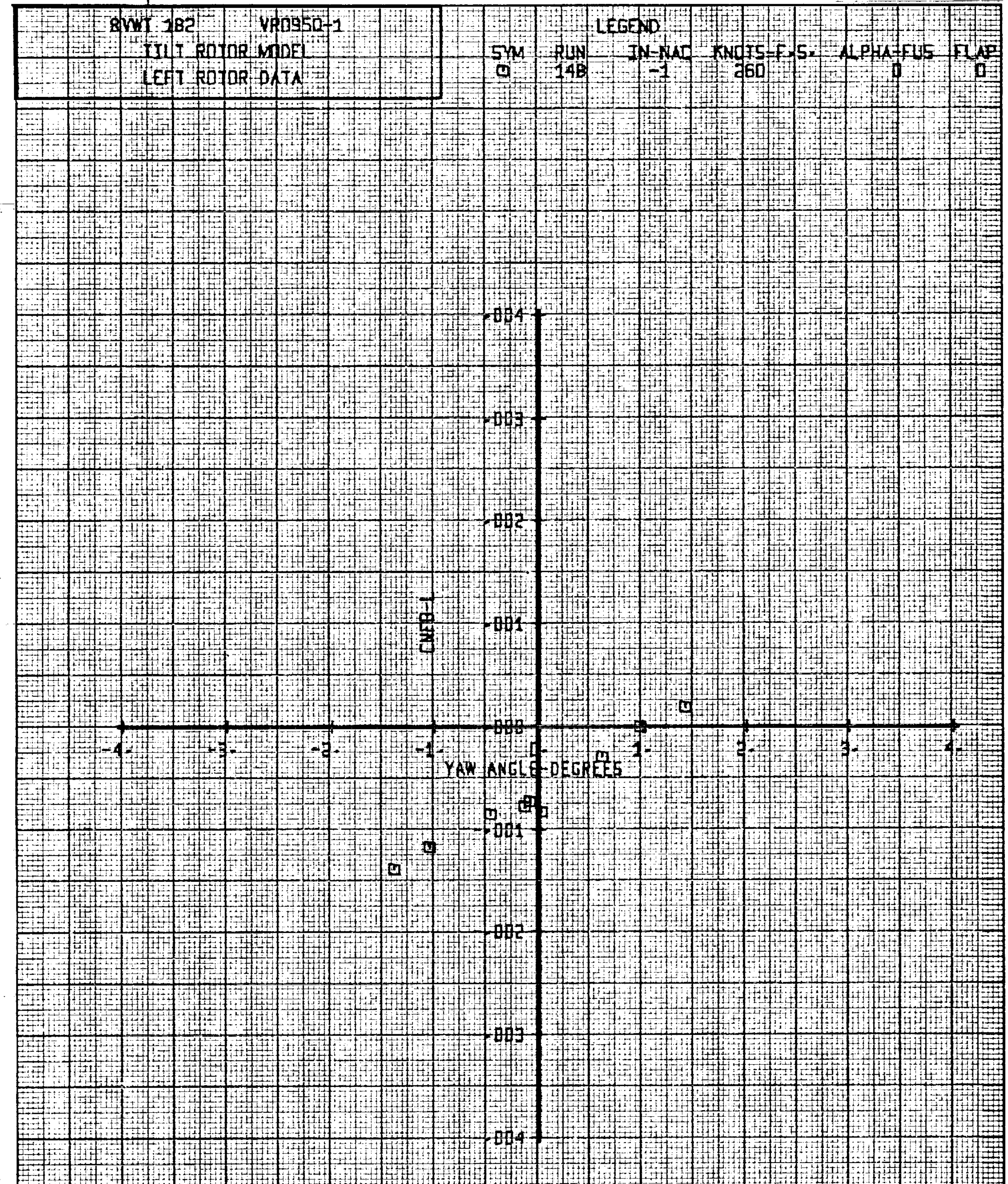


Figure 16-027. Left Rotor Normal Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

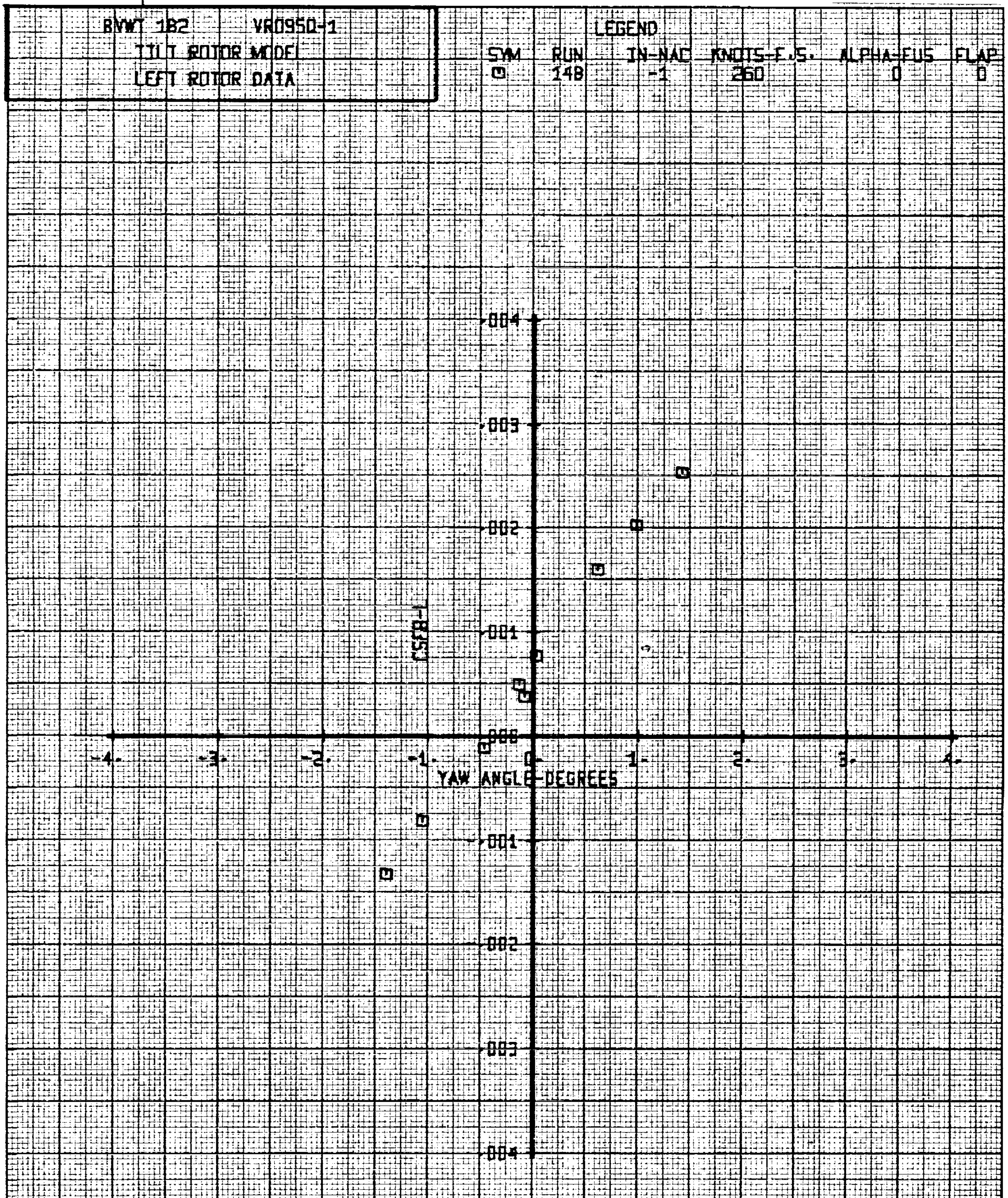


Figure 16-028. Left Rotor Side Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

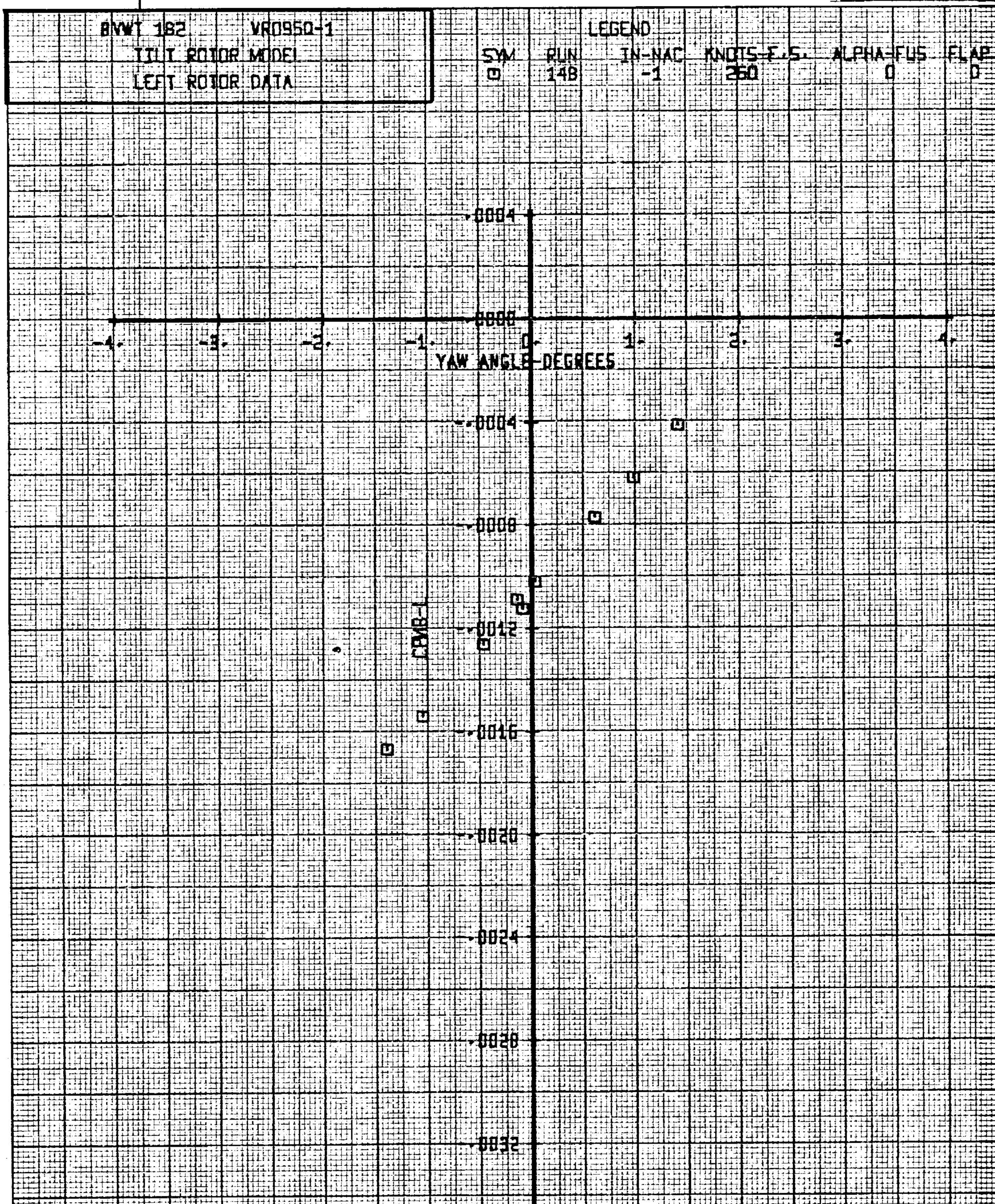


Figure 16-029. Left Rotor Pitching Moment Versus Yaw Angle ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

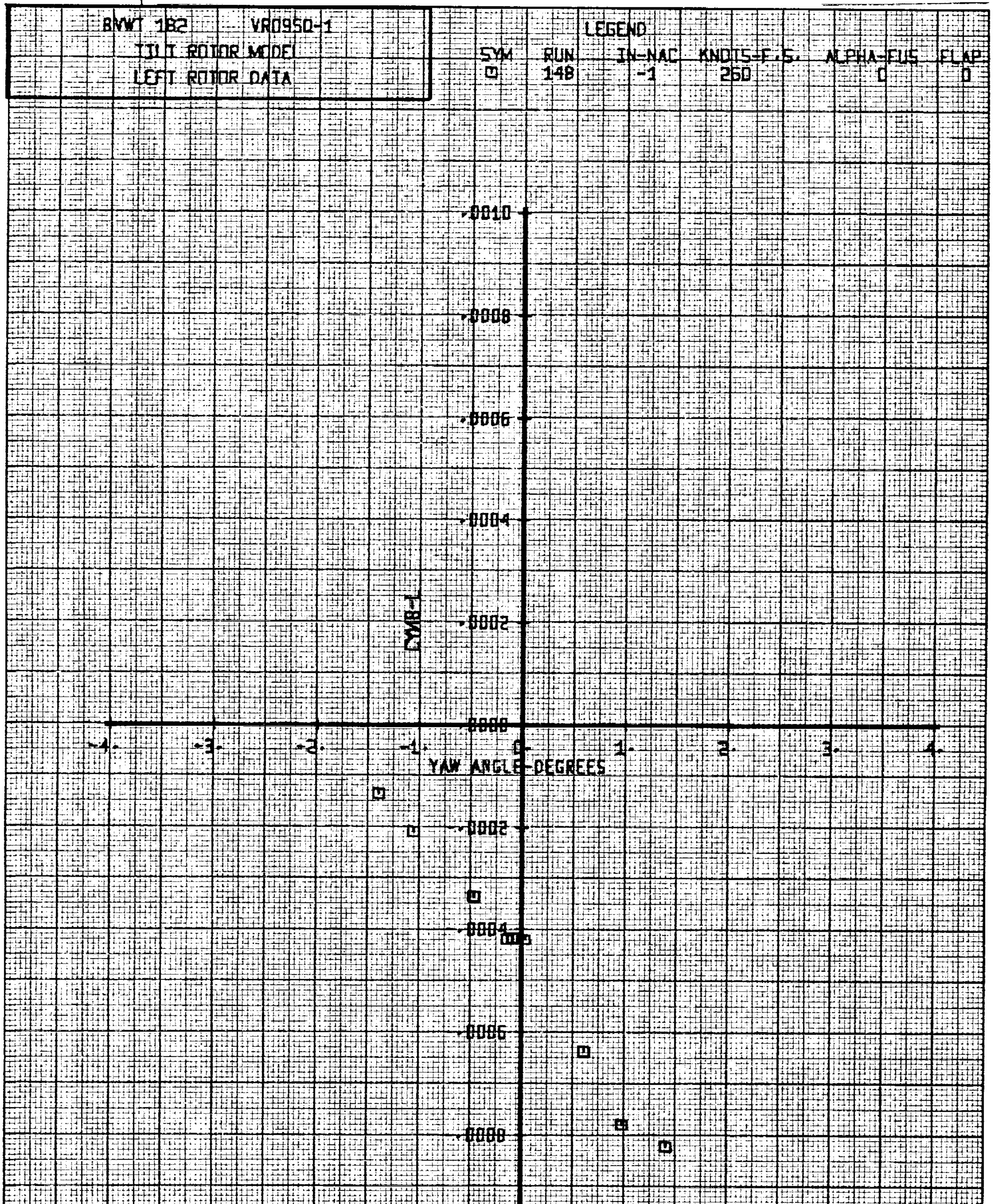


Figure 16-030. Left Rotor Yawing Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

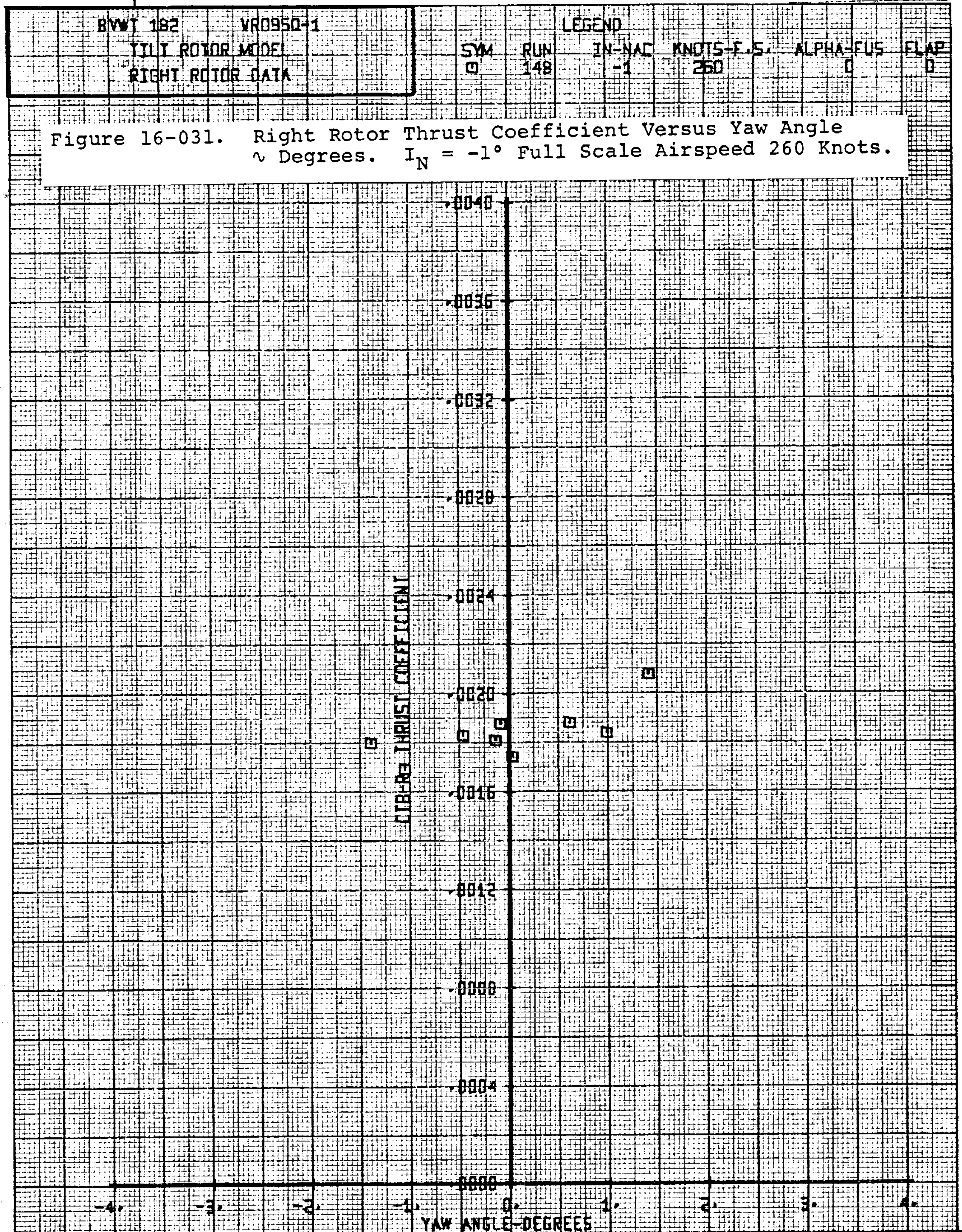


Figure 16-031. Right Rotor Thrust Coefficient Versus Yaw Angle ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

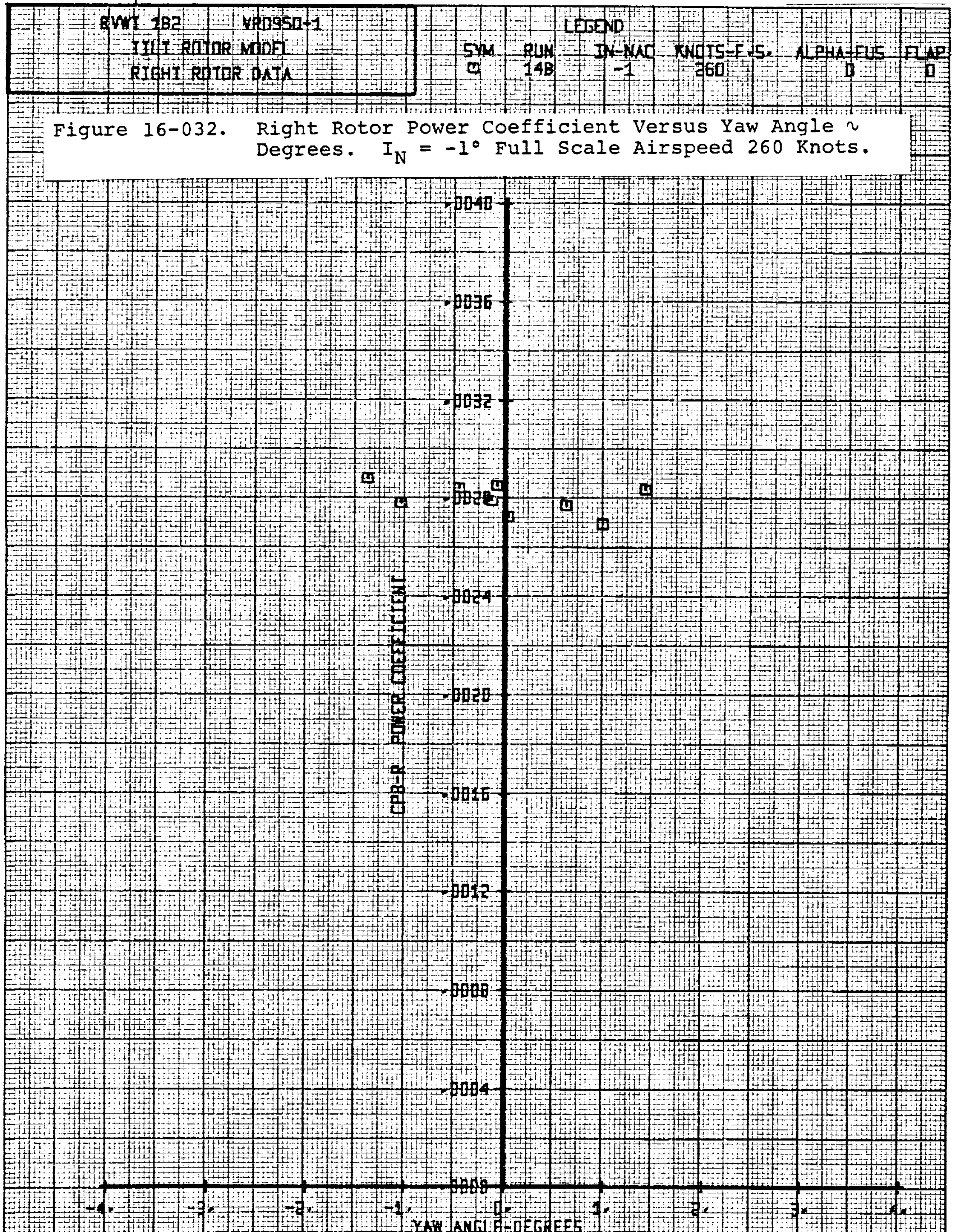


Figure 16-032. Right Rotor Power Coefficient Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

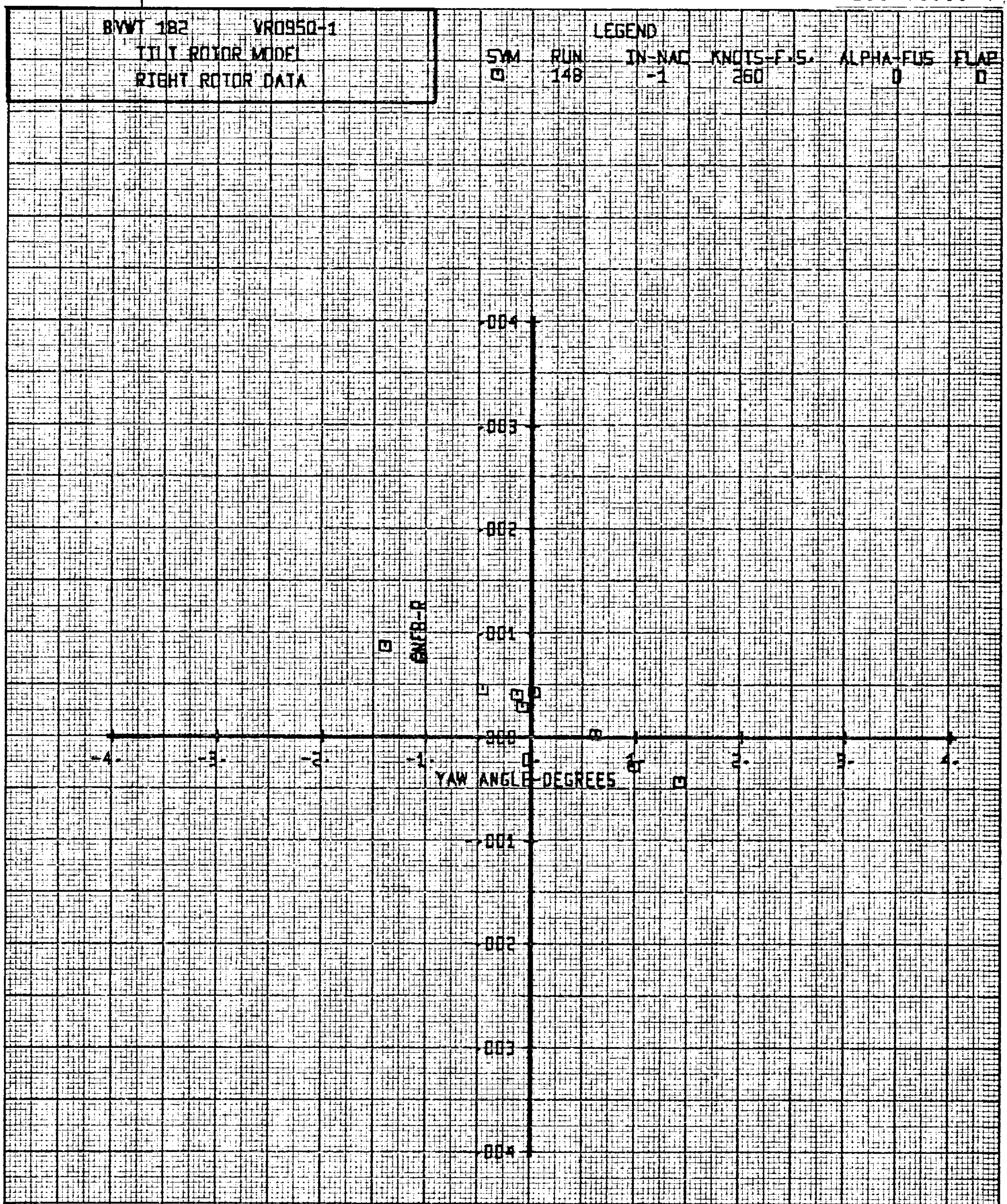


Figure 16-033. Right Rotor Normal Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

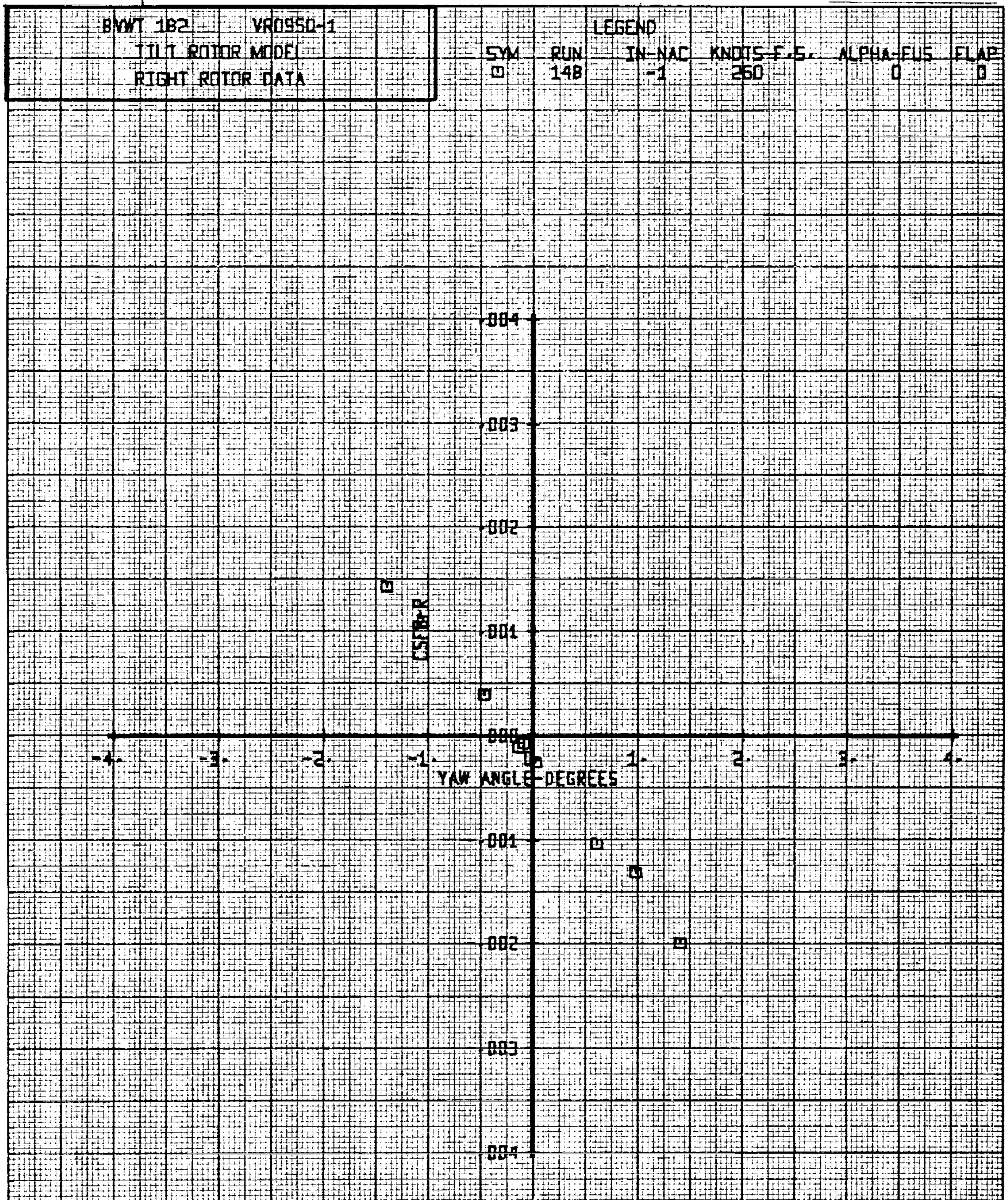


Figure 16-034. Right Rotor Side Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

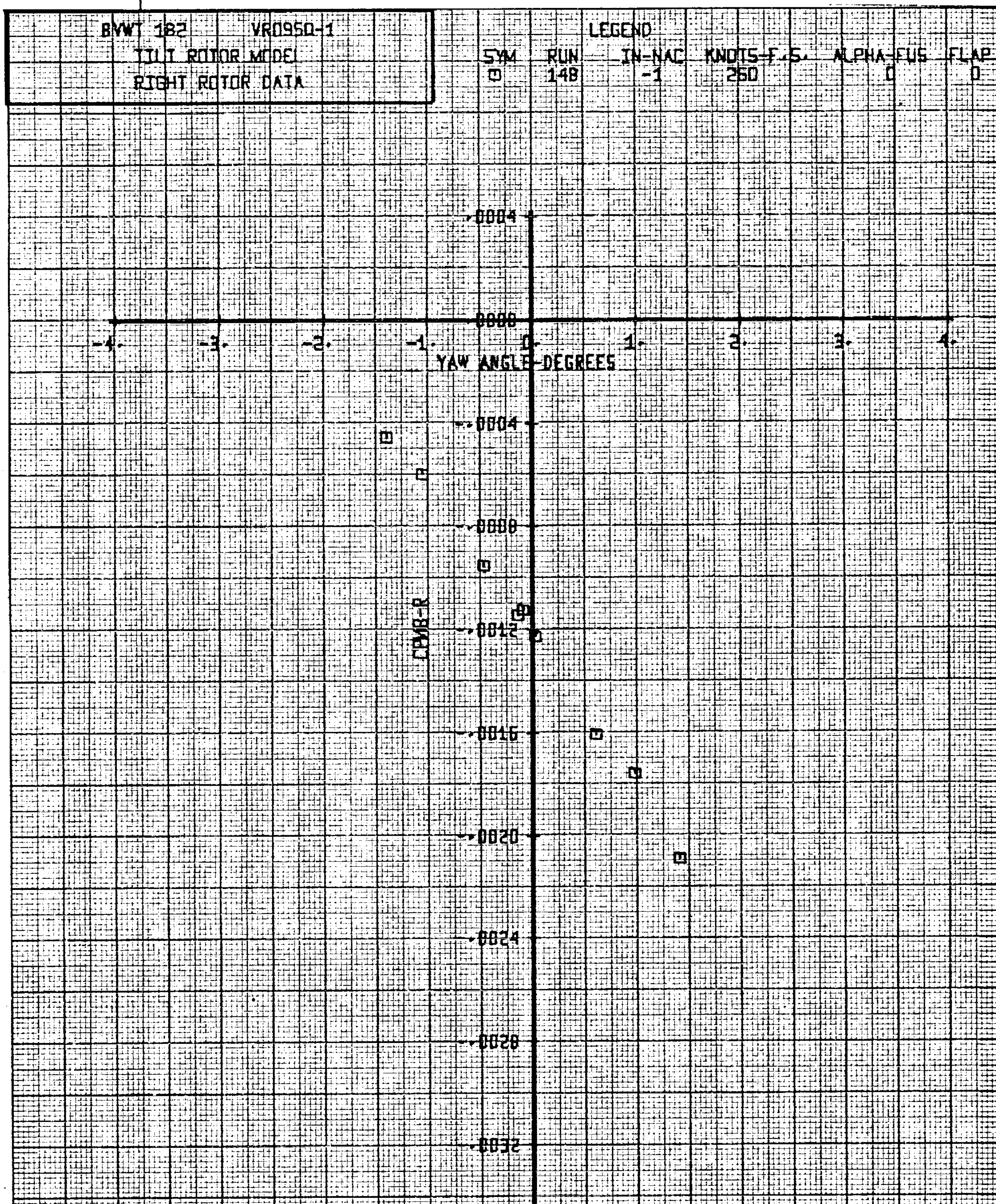


Figure 16-035. Right Rotor Pitching Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

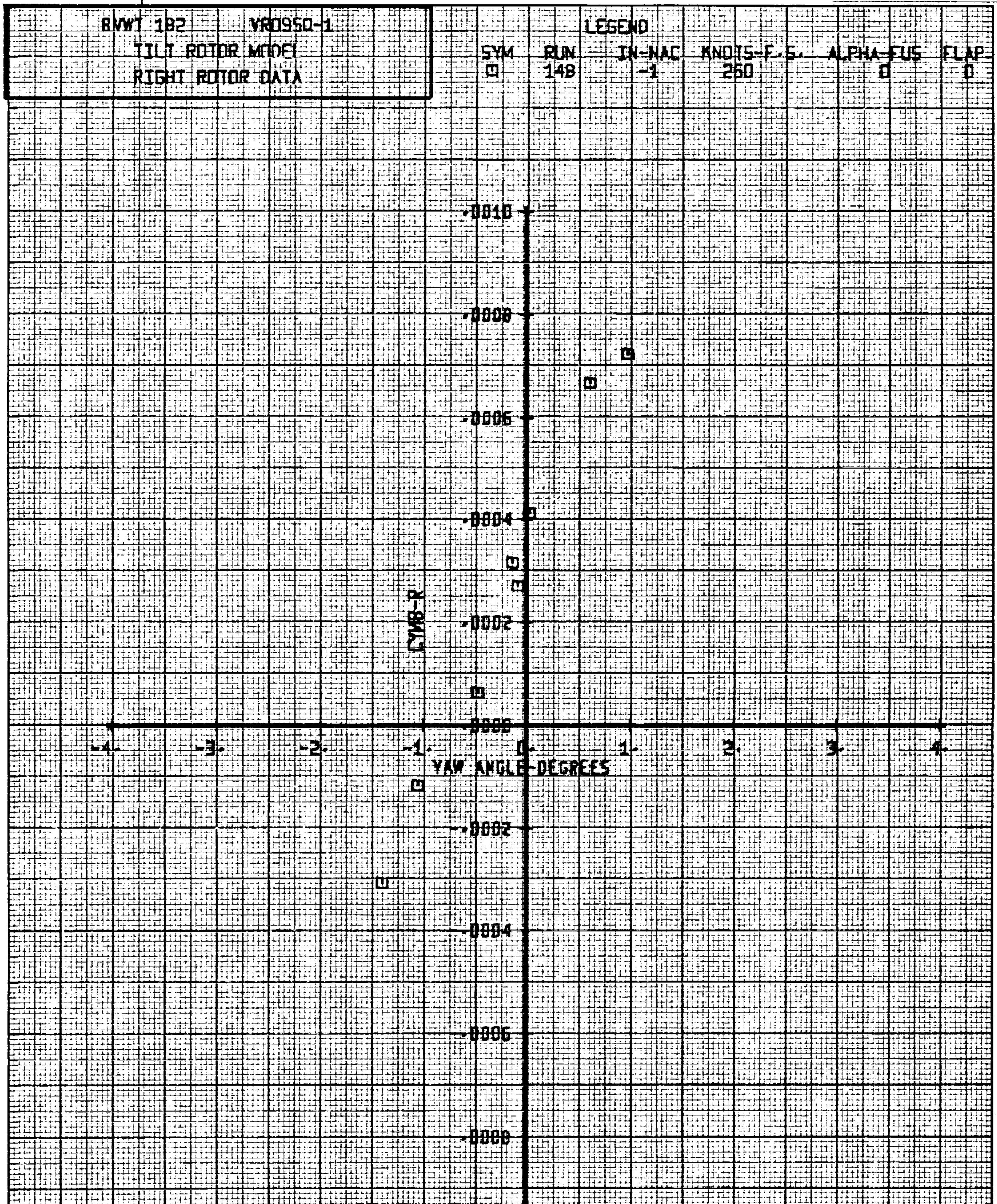


Figure 16-036. Right Rotor Yawing Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

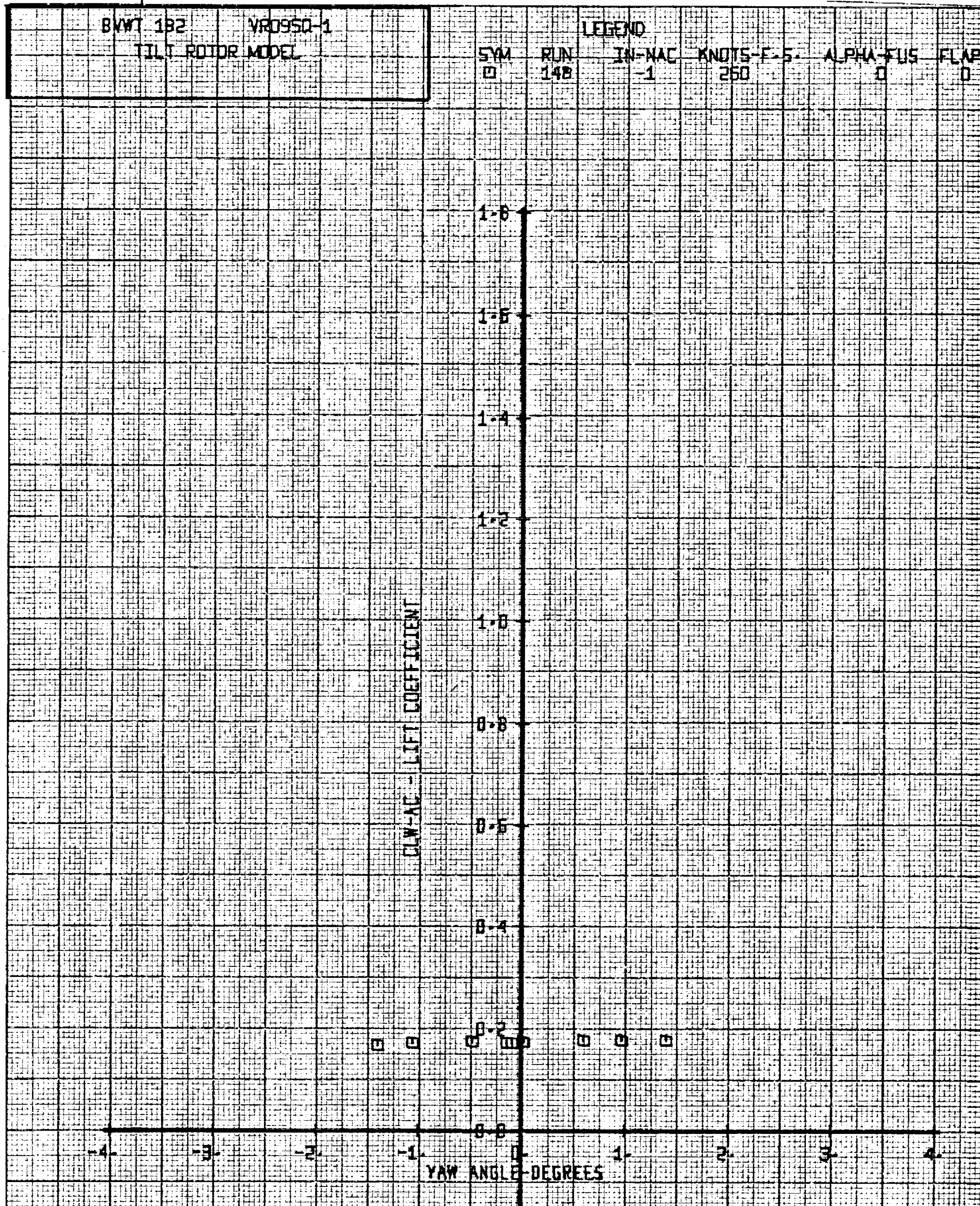


Figure 16-037. Aircraft Lift Coefficient Versus Yaw Angle ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

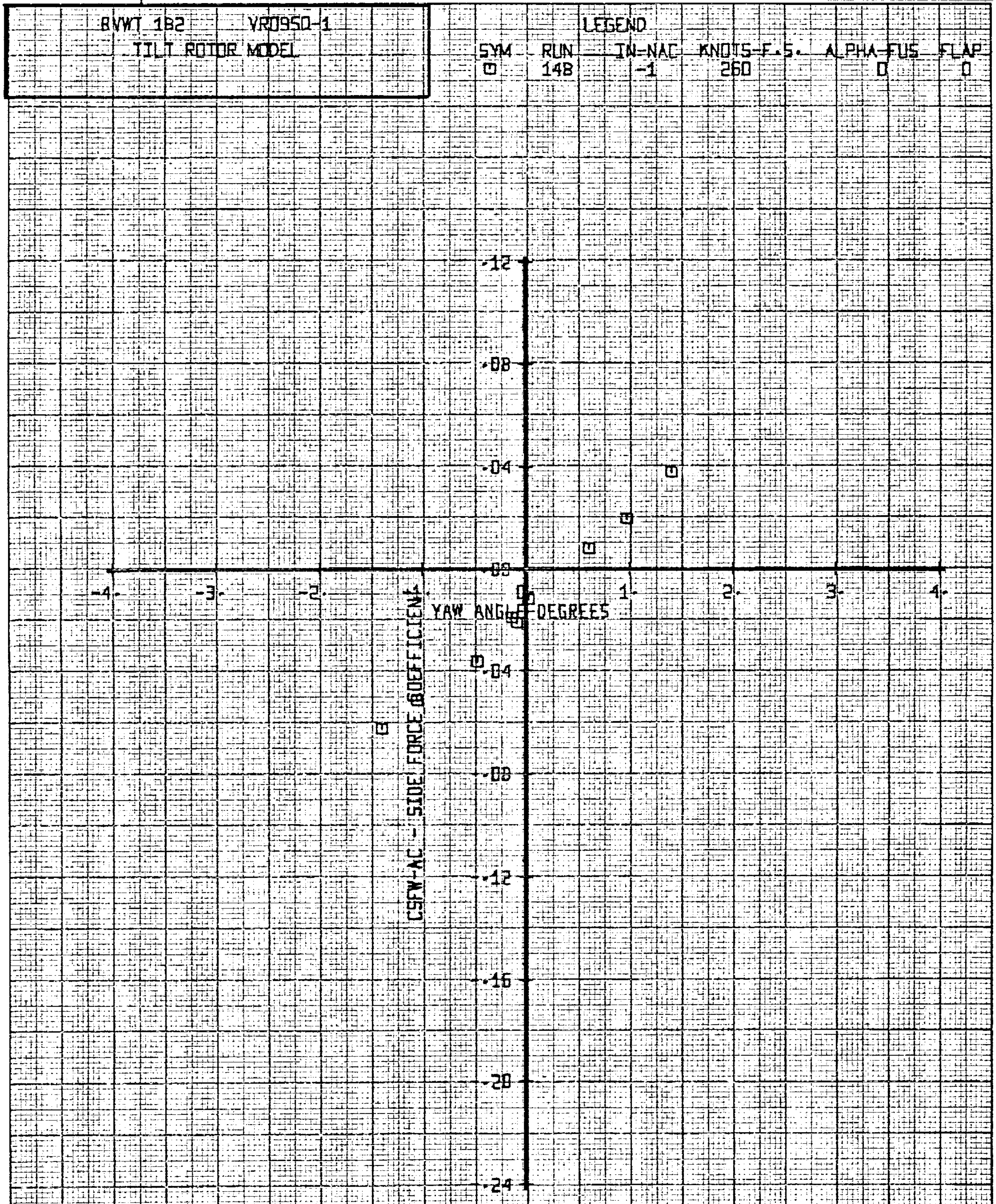


Figure 16-038. Aircraft Side Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

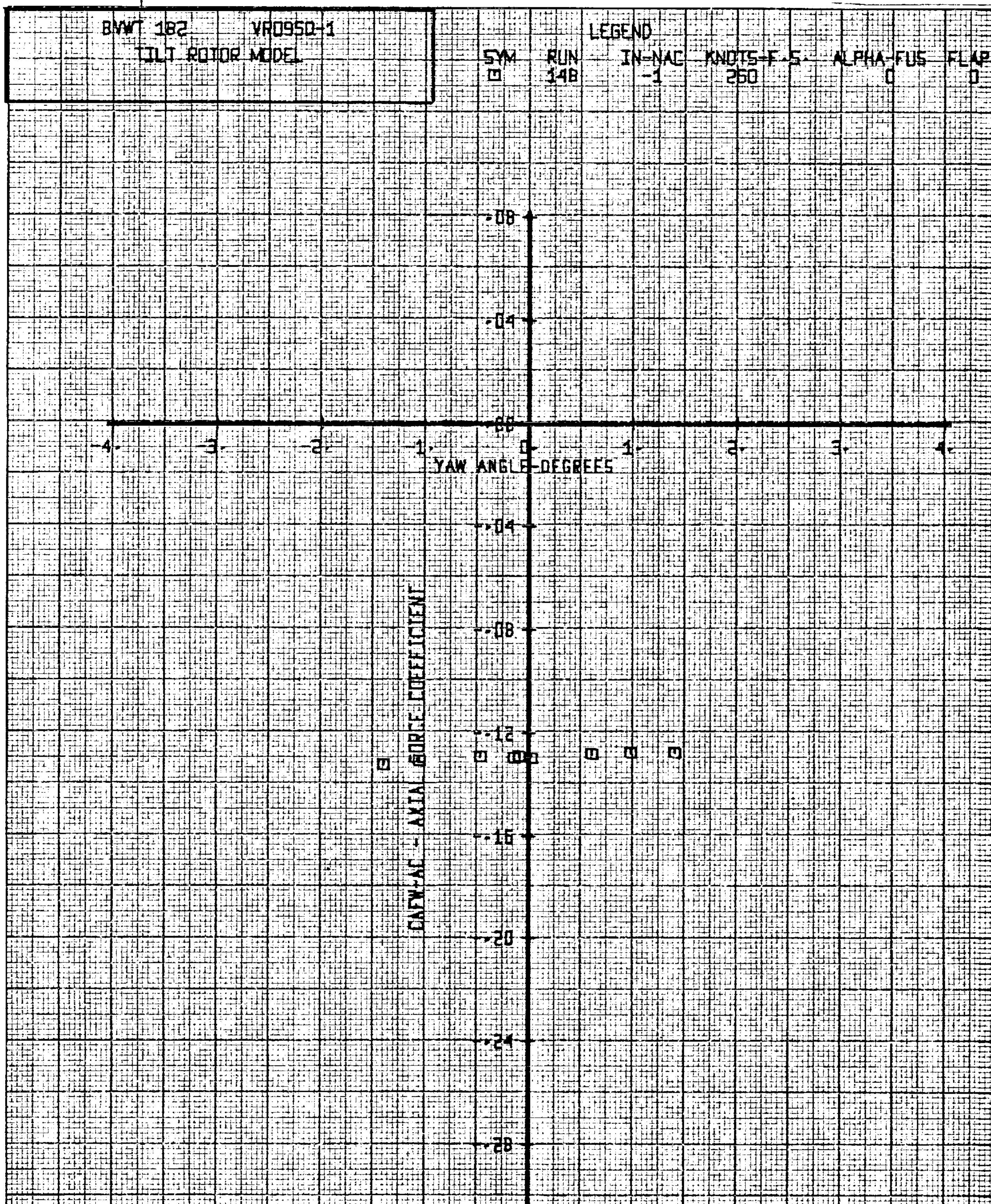


Figure 16-039. Aircraft Axial Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

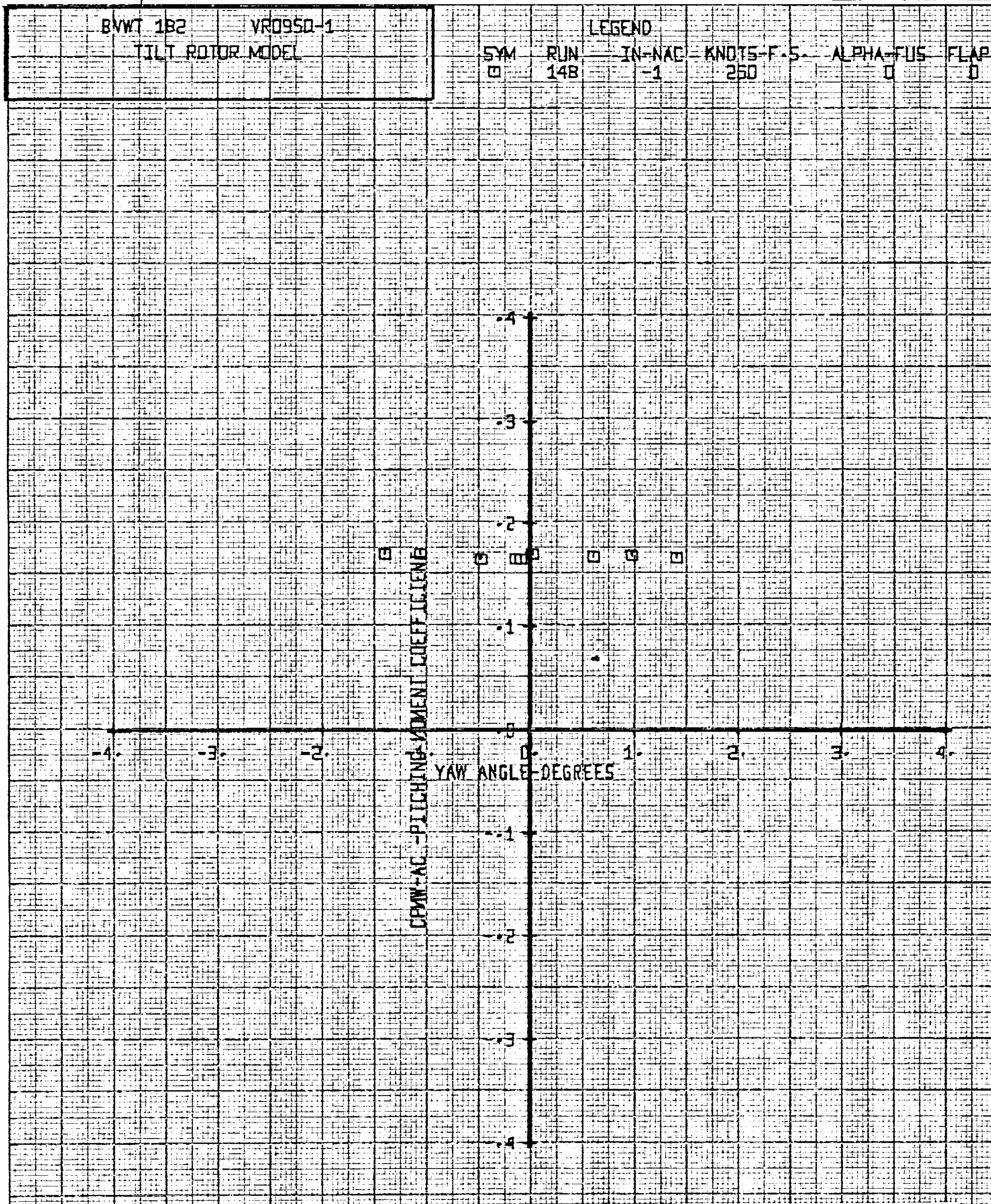


Figure 16-040. Aircraft Pitching Moment Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

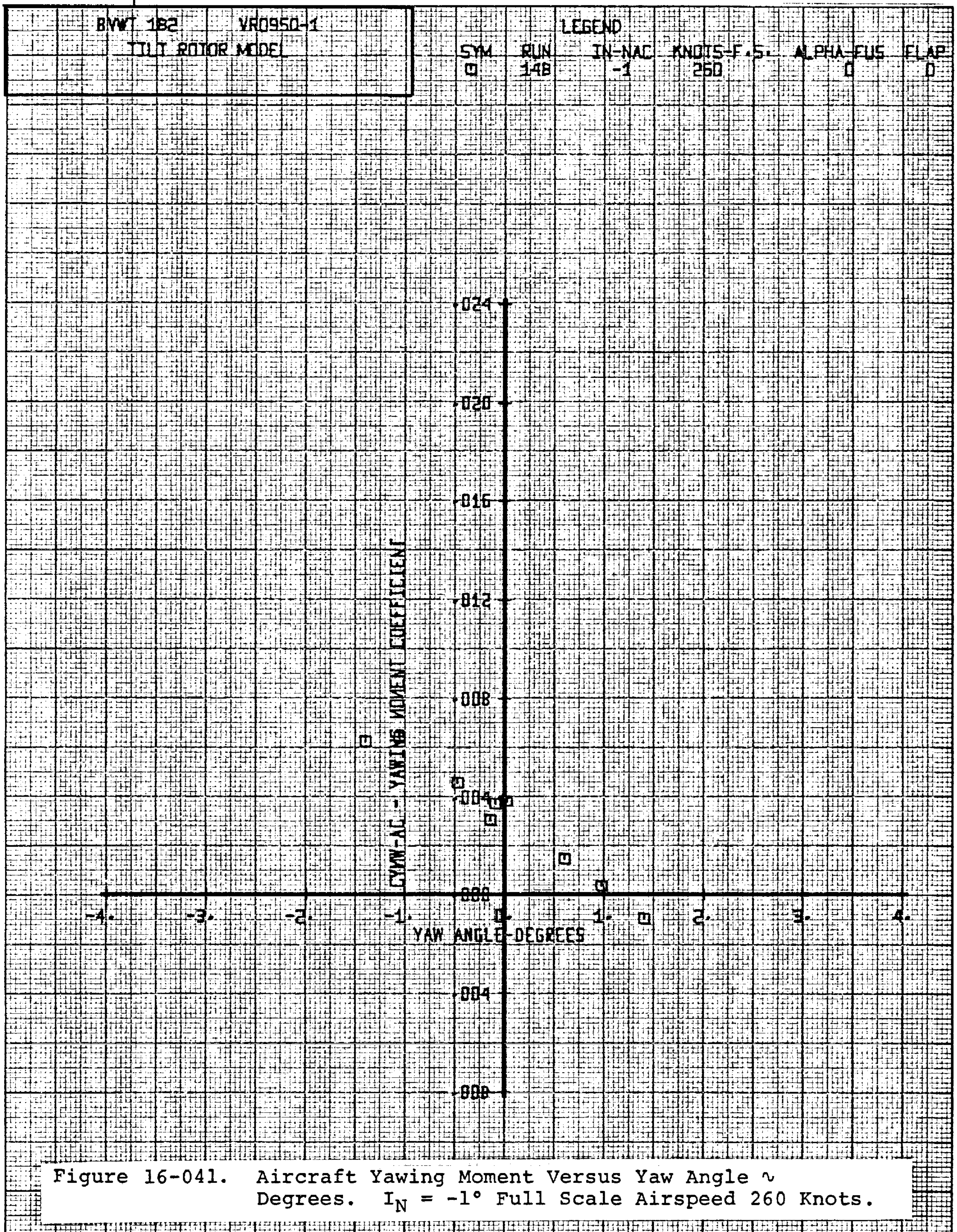


Figure 16-041. Aircraft Yawing Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

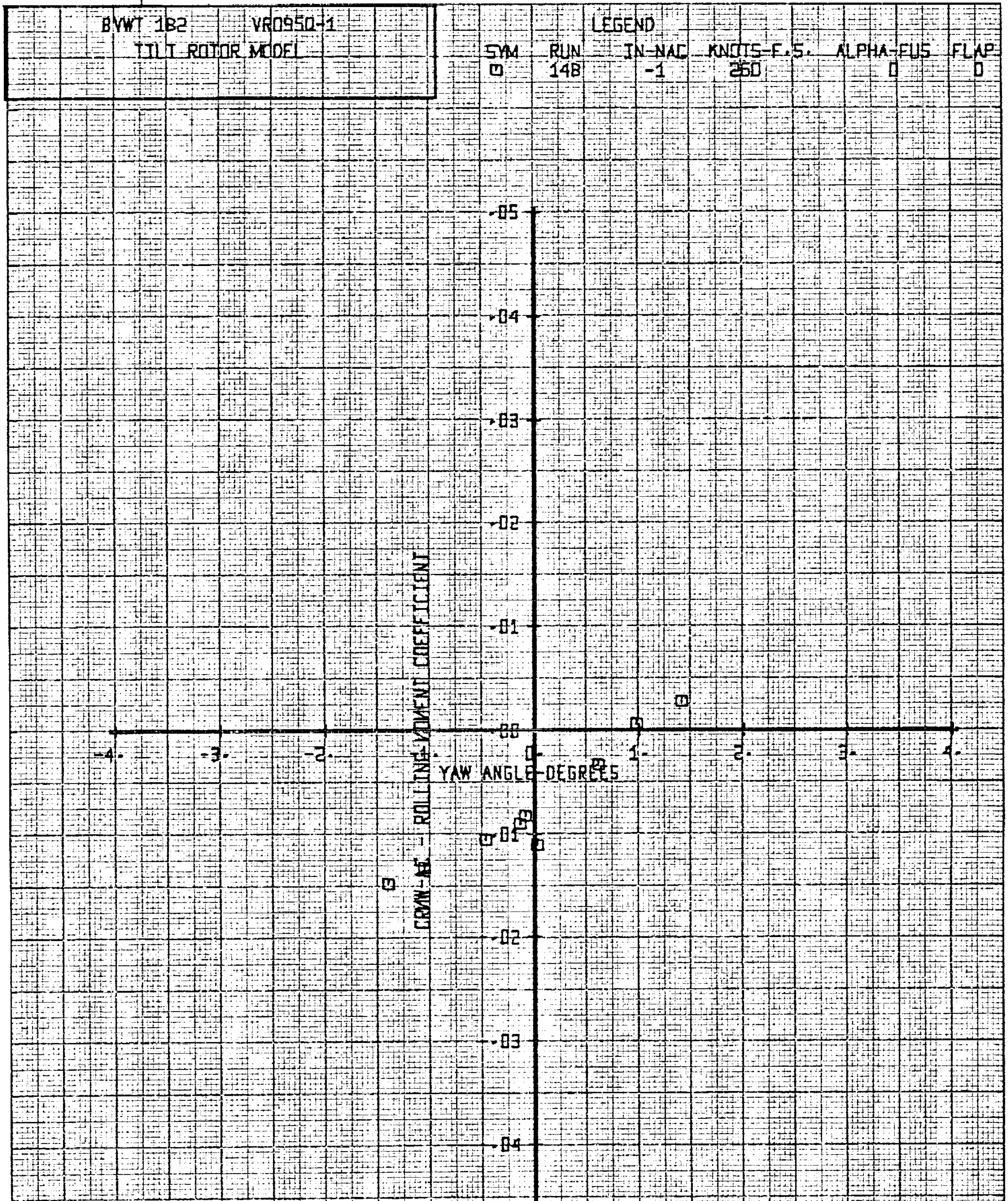


Figure 16-042. Aircraft Rolling Moment Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

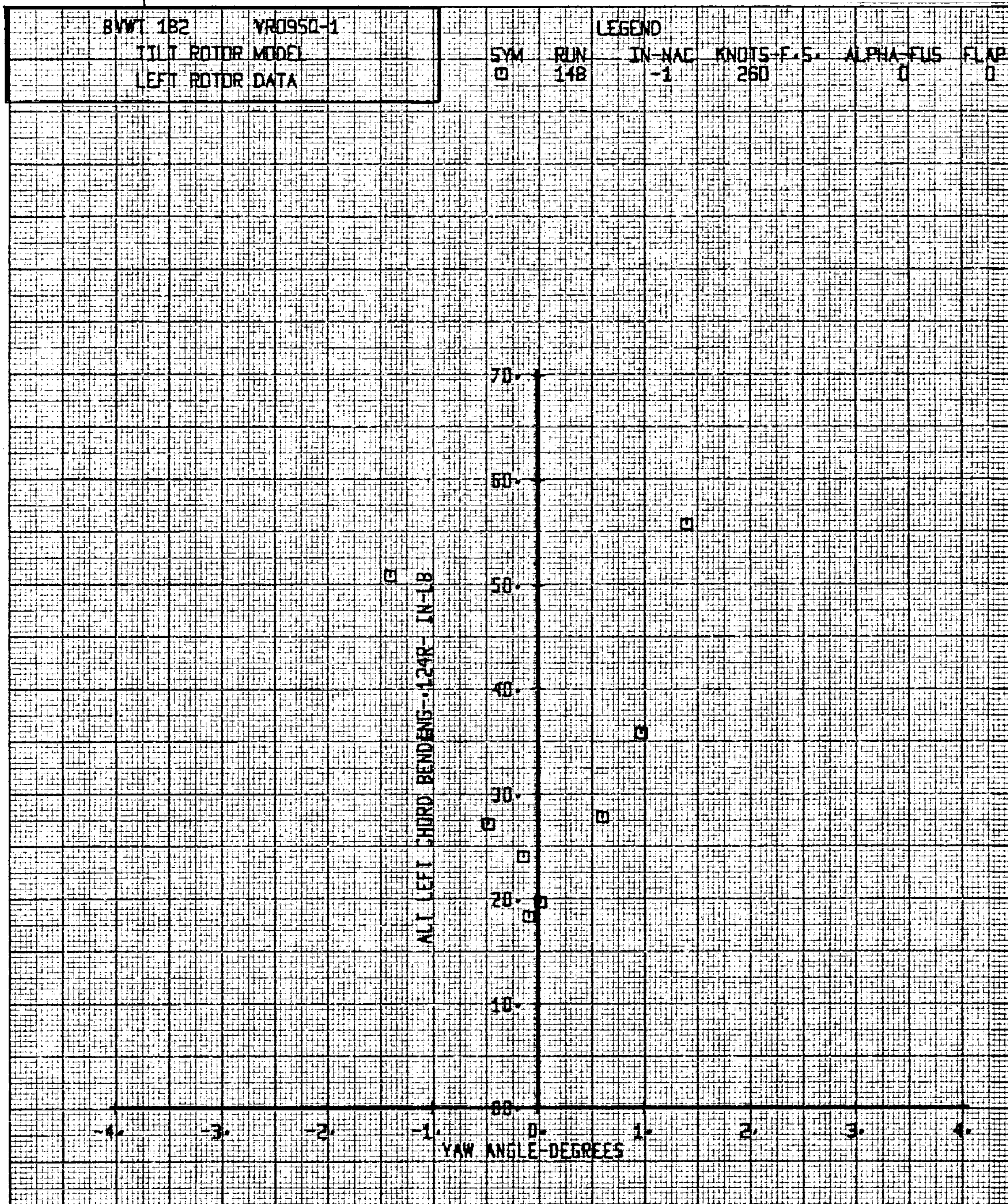


Figure 16-043. Alt. Left Chord Bending Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

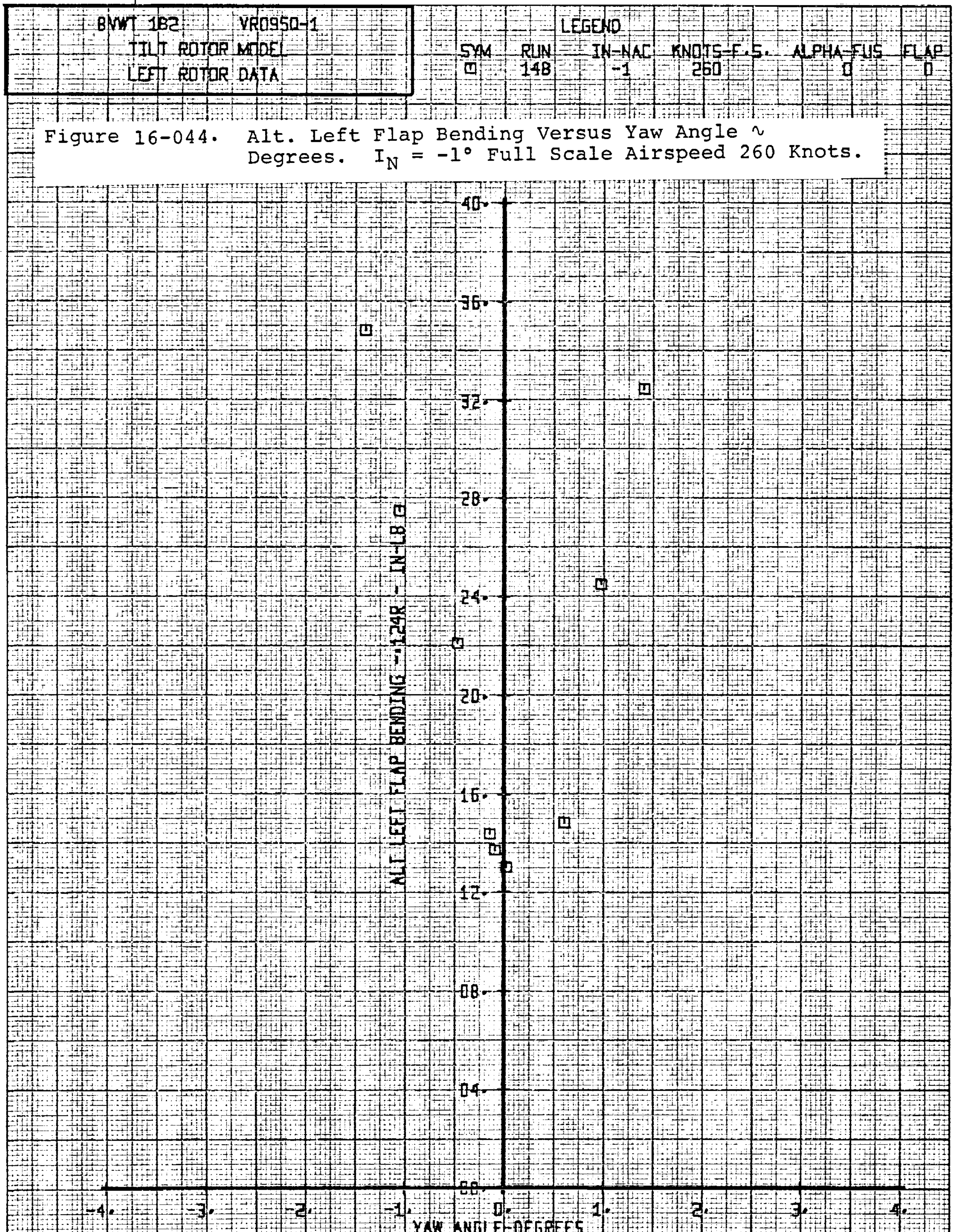


Figure 16-044. Alt. Left Flap Bending Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

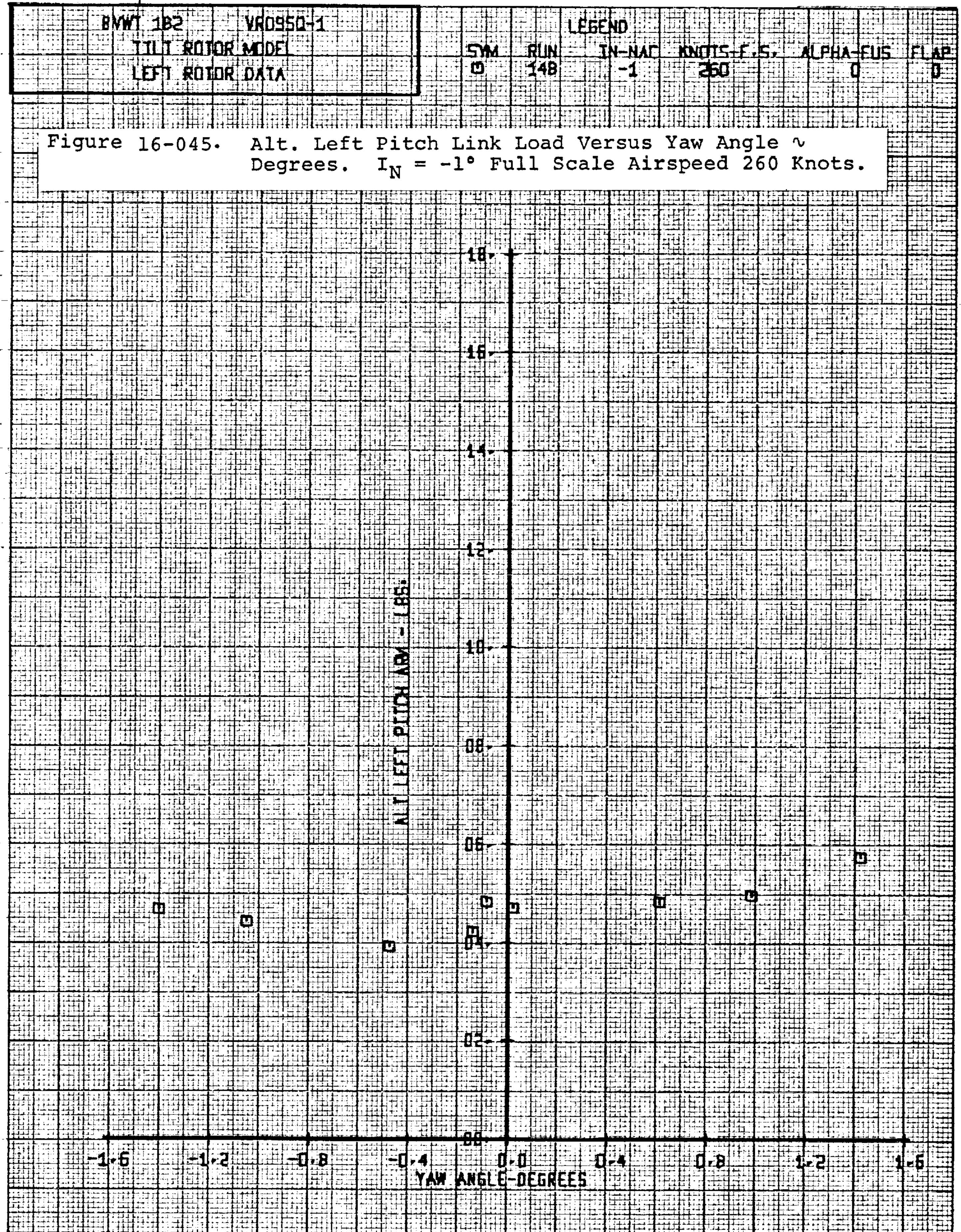


Figure 16-045. Alt. Left Pitch Link Load Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

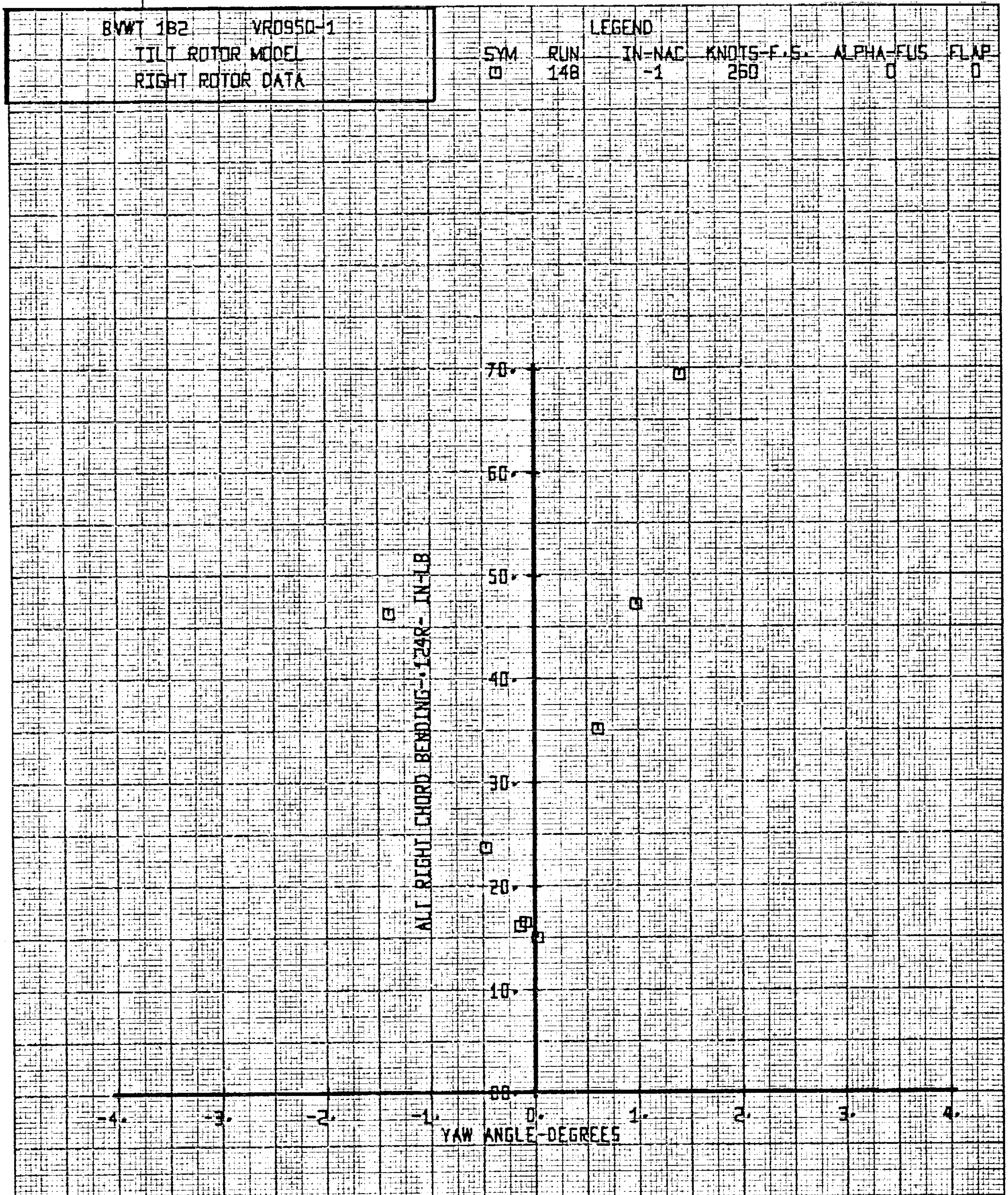


Figure 16-046. Alt. Right Chord Bending Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

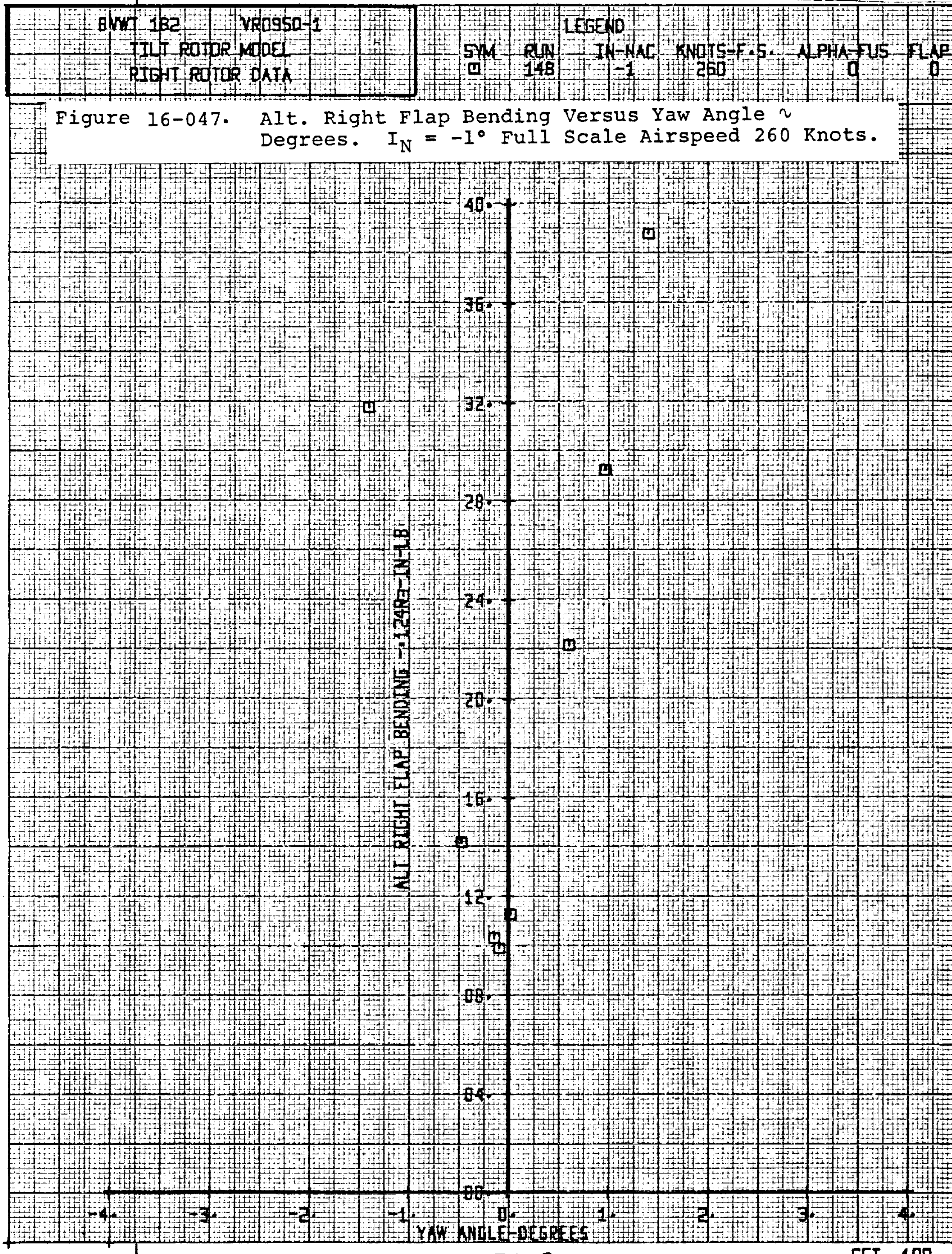
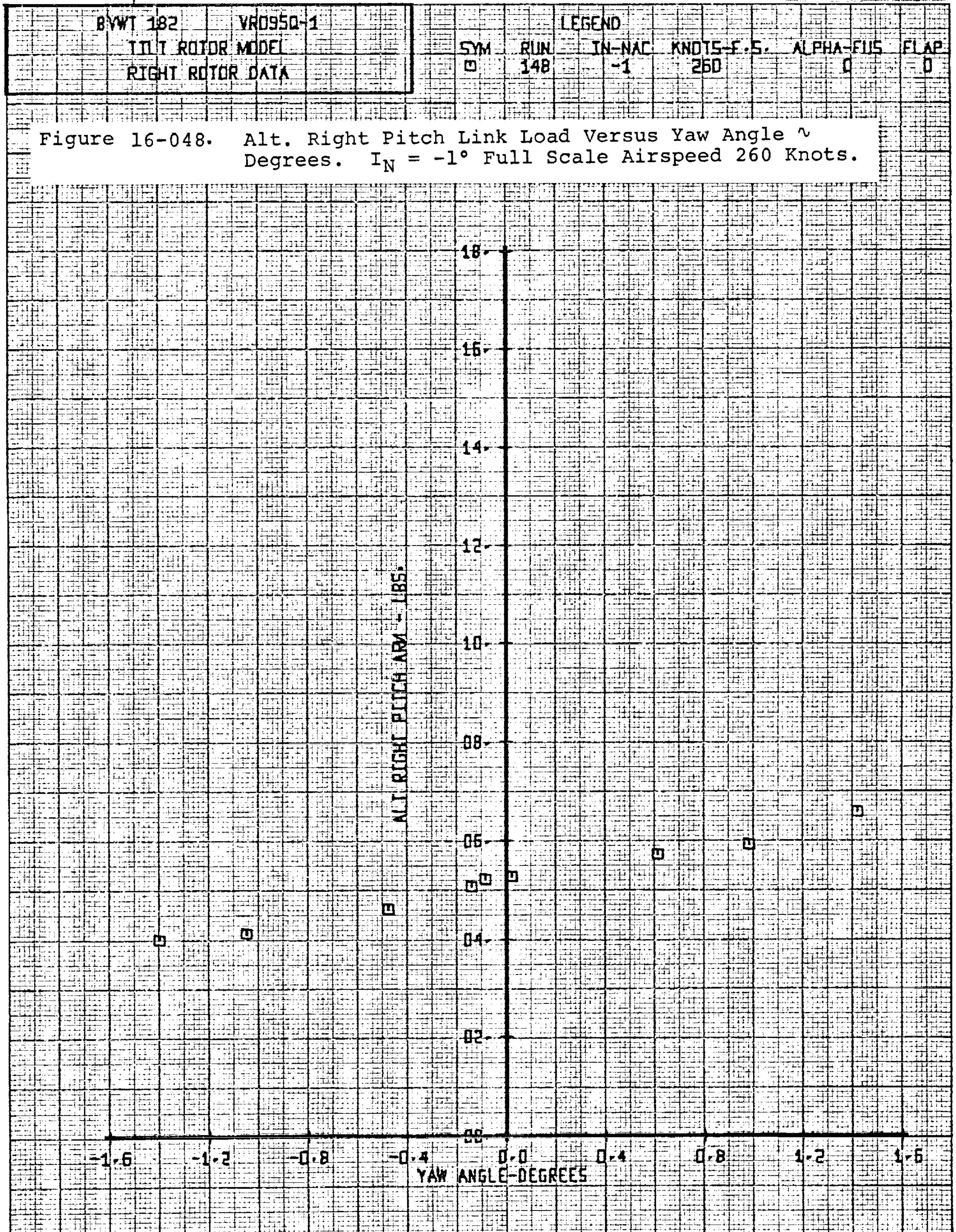


Figure 16-047. Alt. Right Flap Bending Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

Figure 16-048. Alt. Right Pitch Link Load Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.



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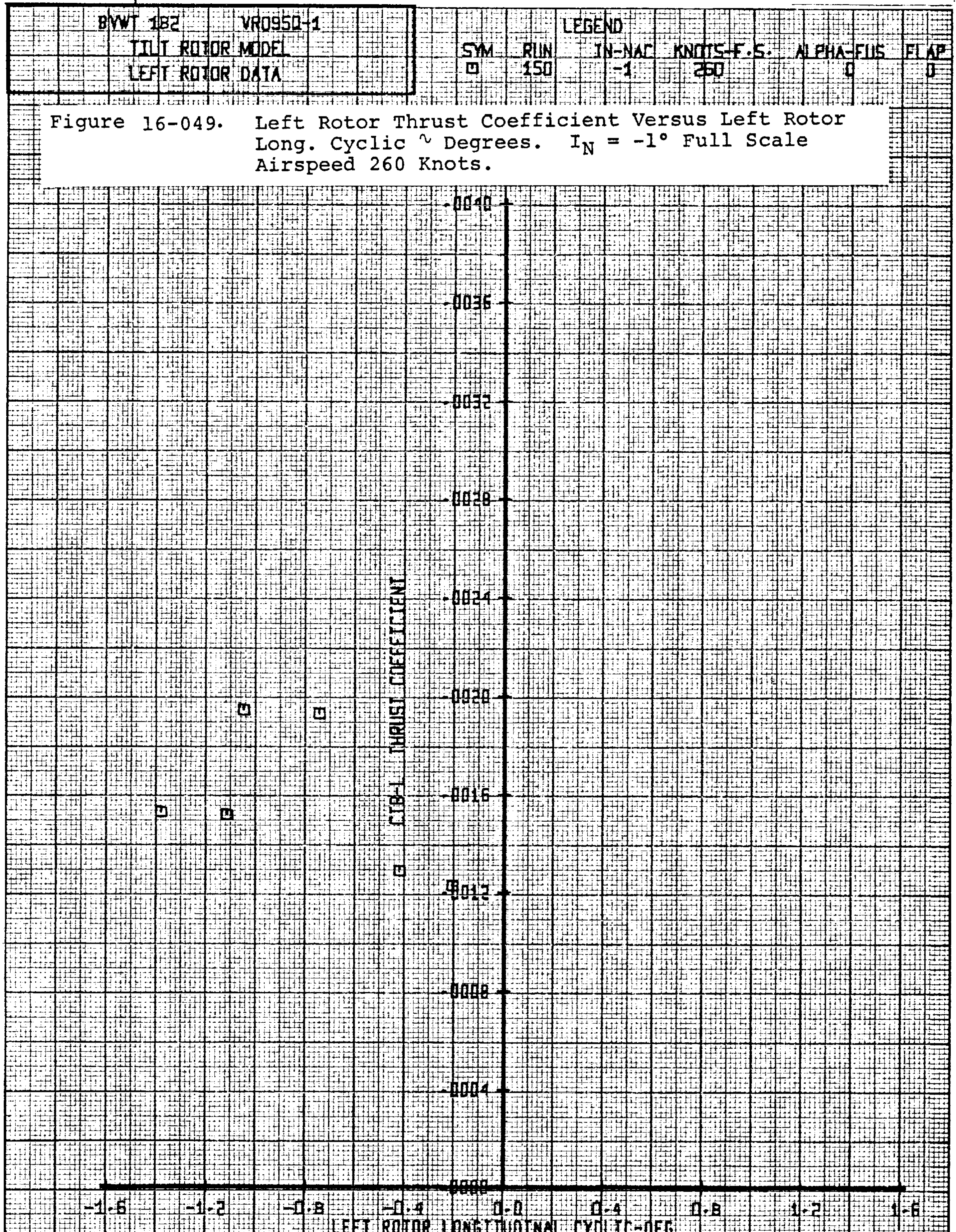
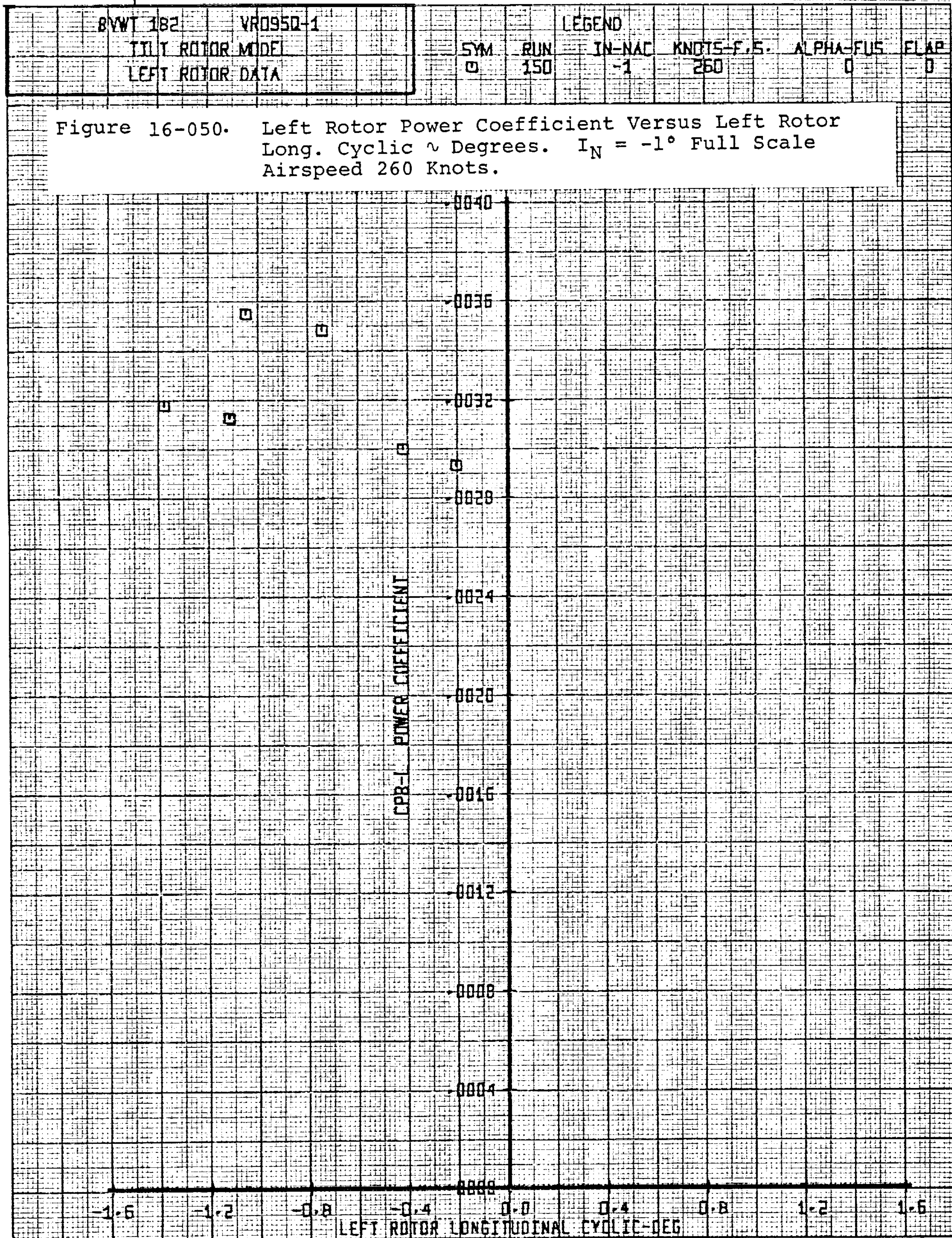


Figure 16-049. Left Rotor Thrust Coefficient Versus Left Rotor Long. Cyclic ~ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

Figure 16-050. Left Rotor Power Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.



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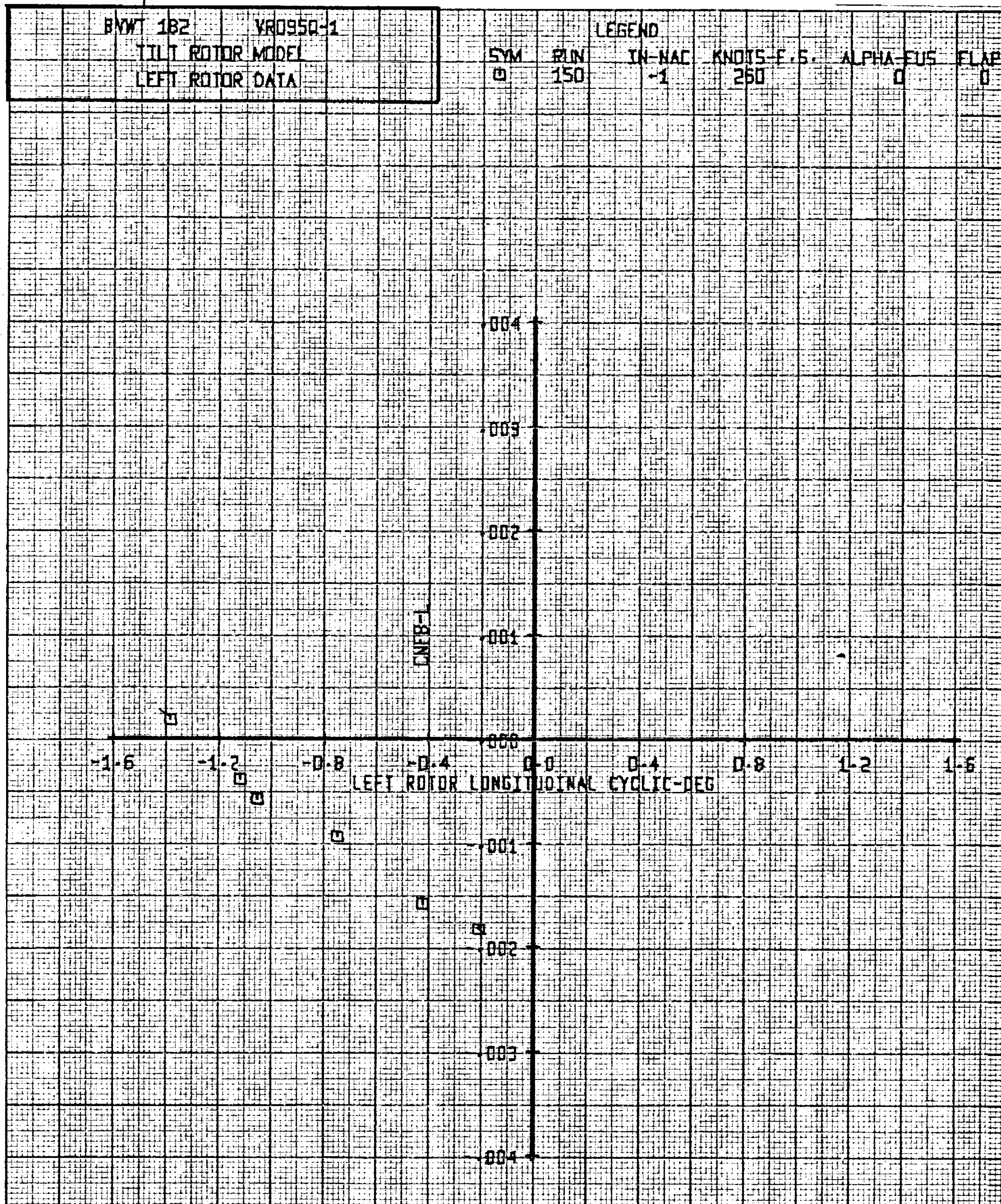

Figure 16-051. Left Rotor Normal Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

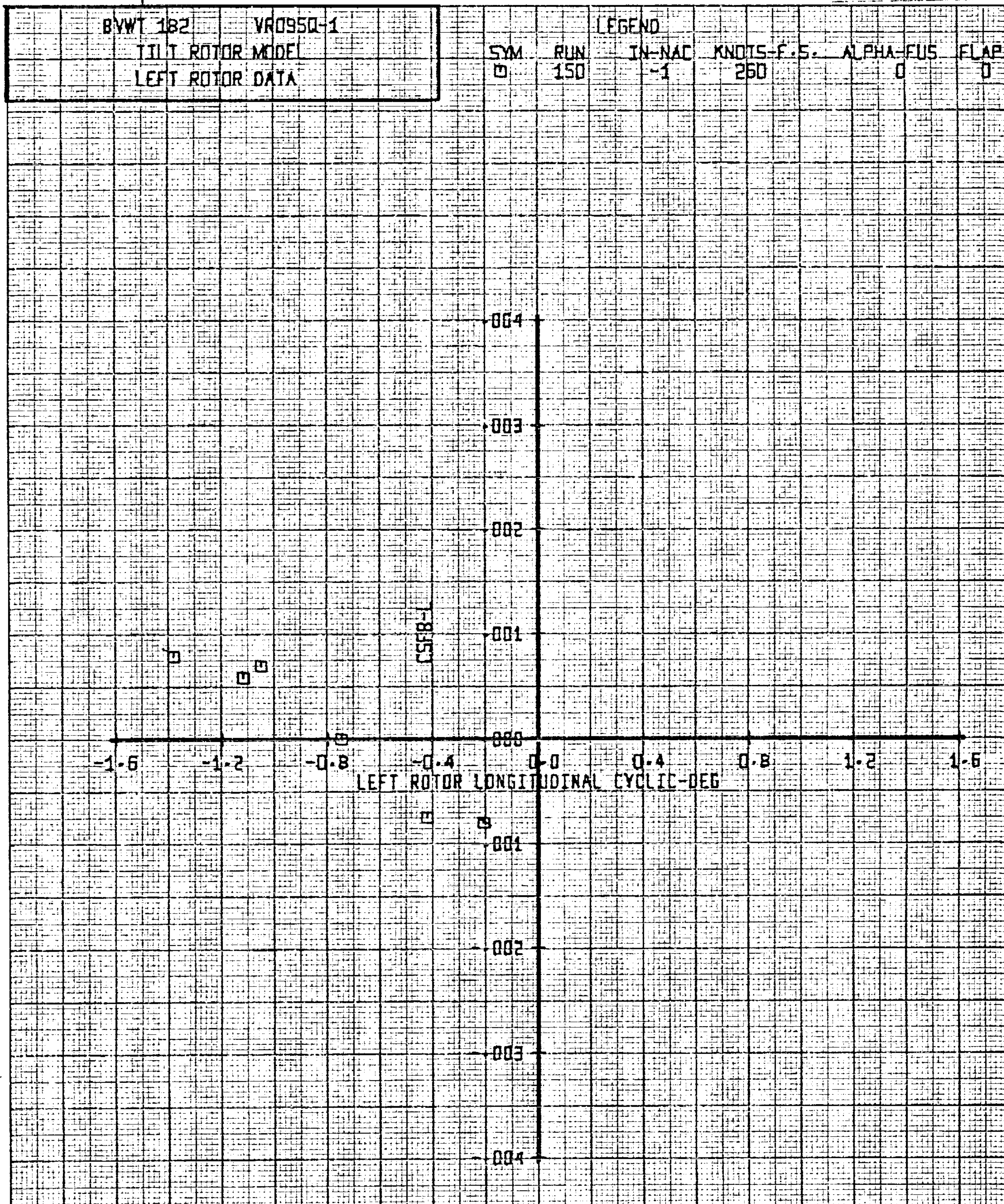

Figure 16-052. Left Rotor Side Force Coefficient Versus Left Rotor Long. Cyclic ~ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

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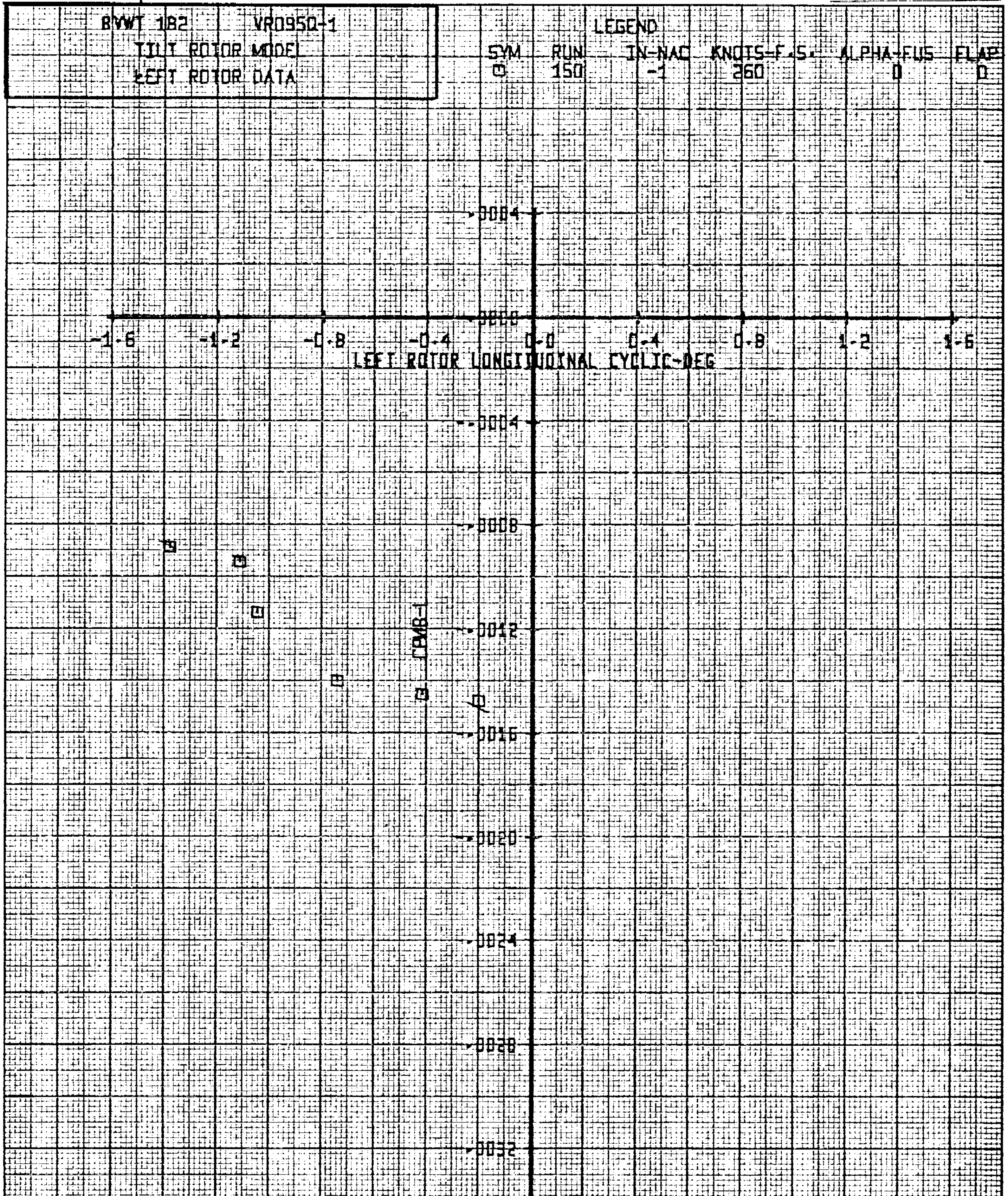


Figure 16-053. Left Rotor Pitching Moment Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

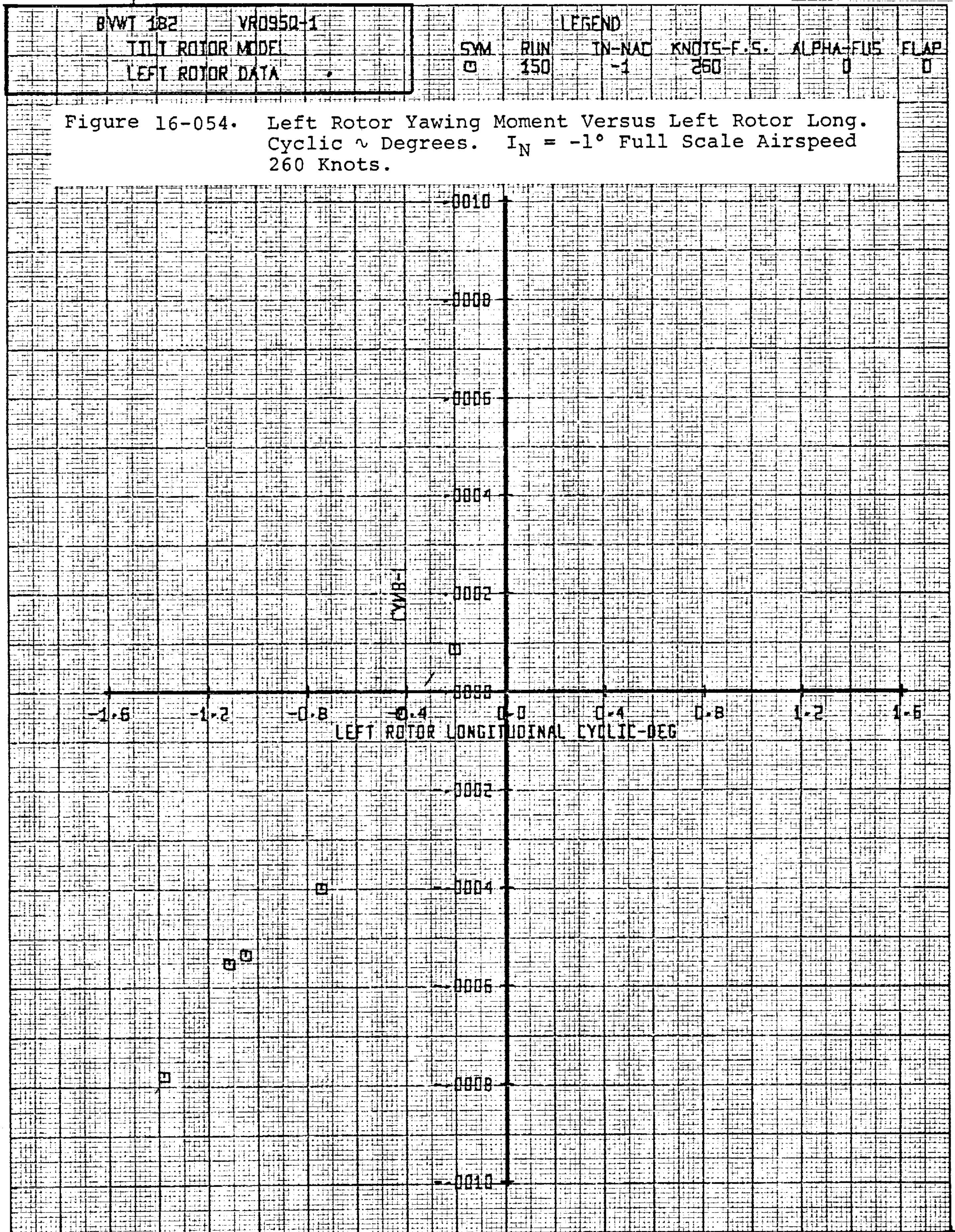


Figure 16-054. Left Rotor Yawing Moment Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

Figure 16-055. Right Rotor Thrust Coefficient Versus Right Rotor Long. Cyclic ~ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

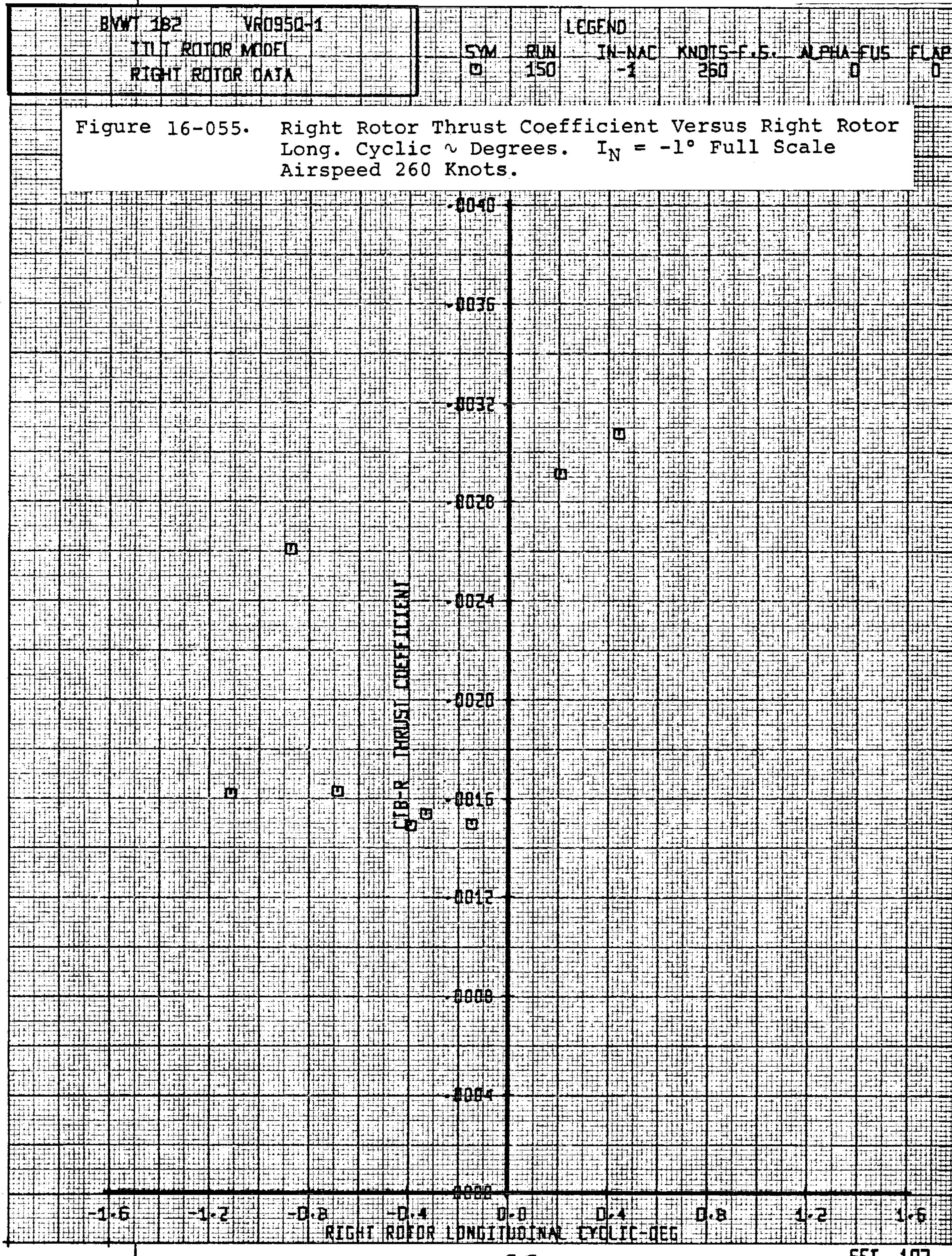
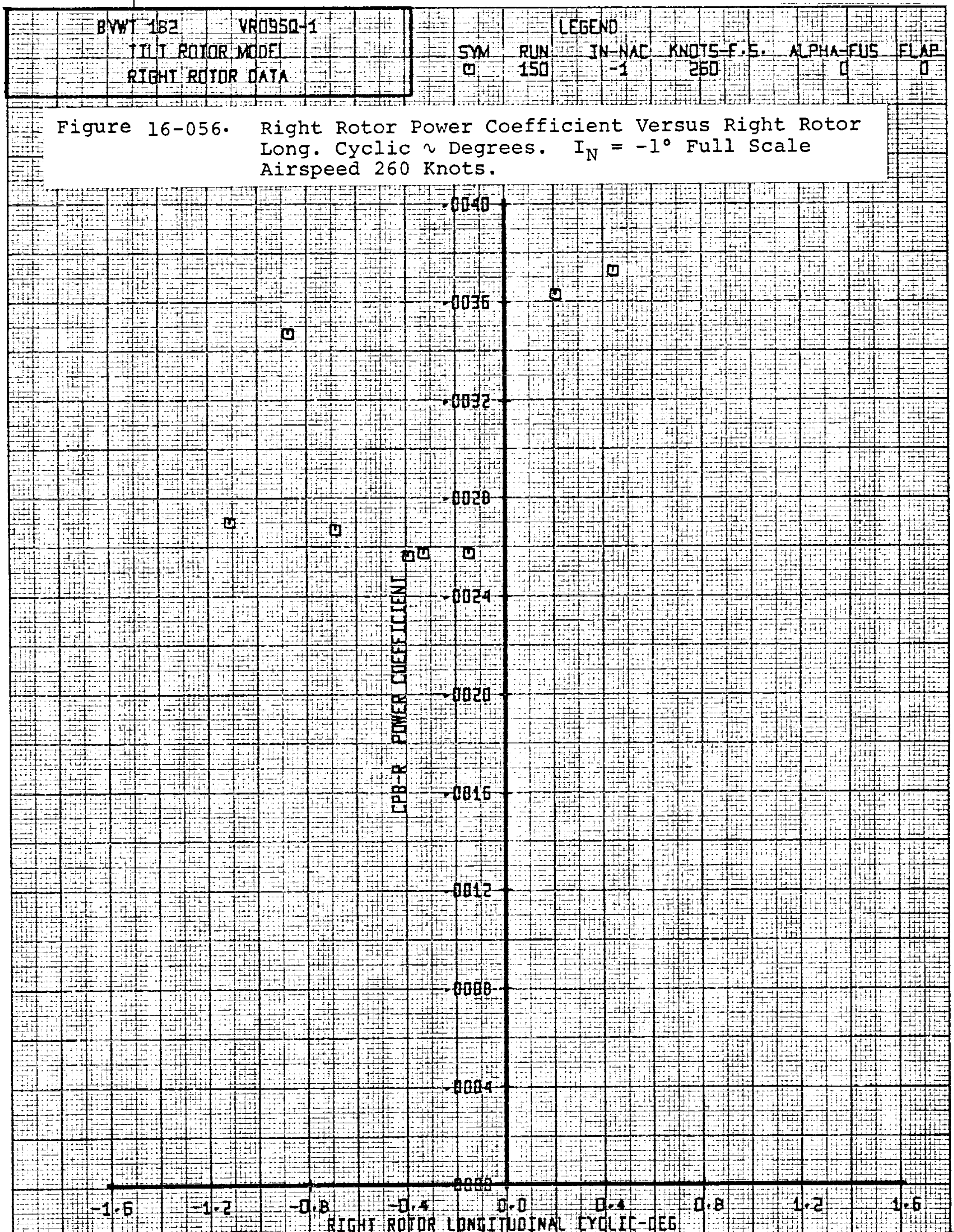


Figure 16-056. Right Rotor Power Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.



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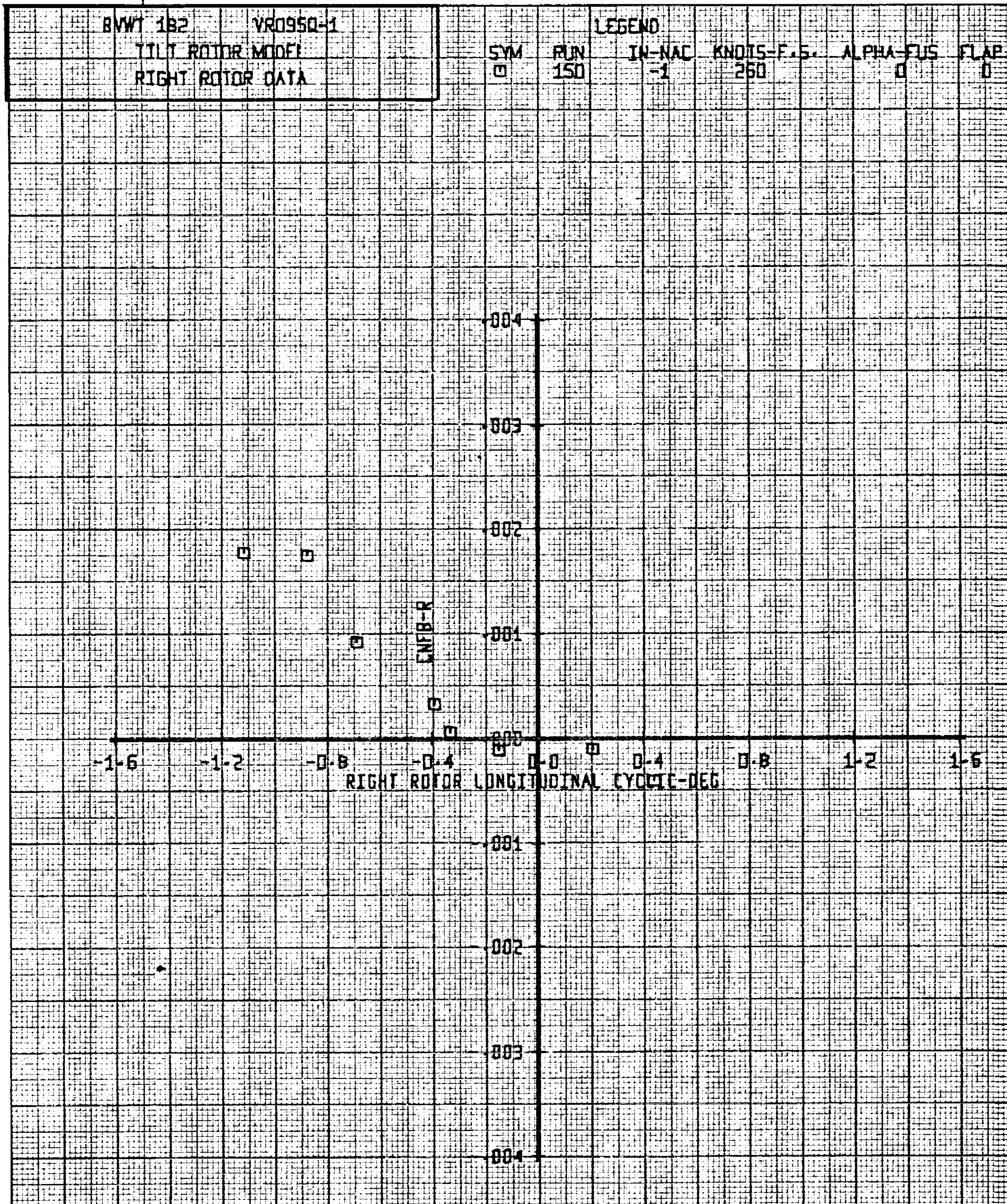


Figure 16-057. Right Rotor Normal Force Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

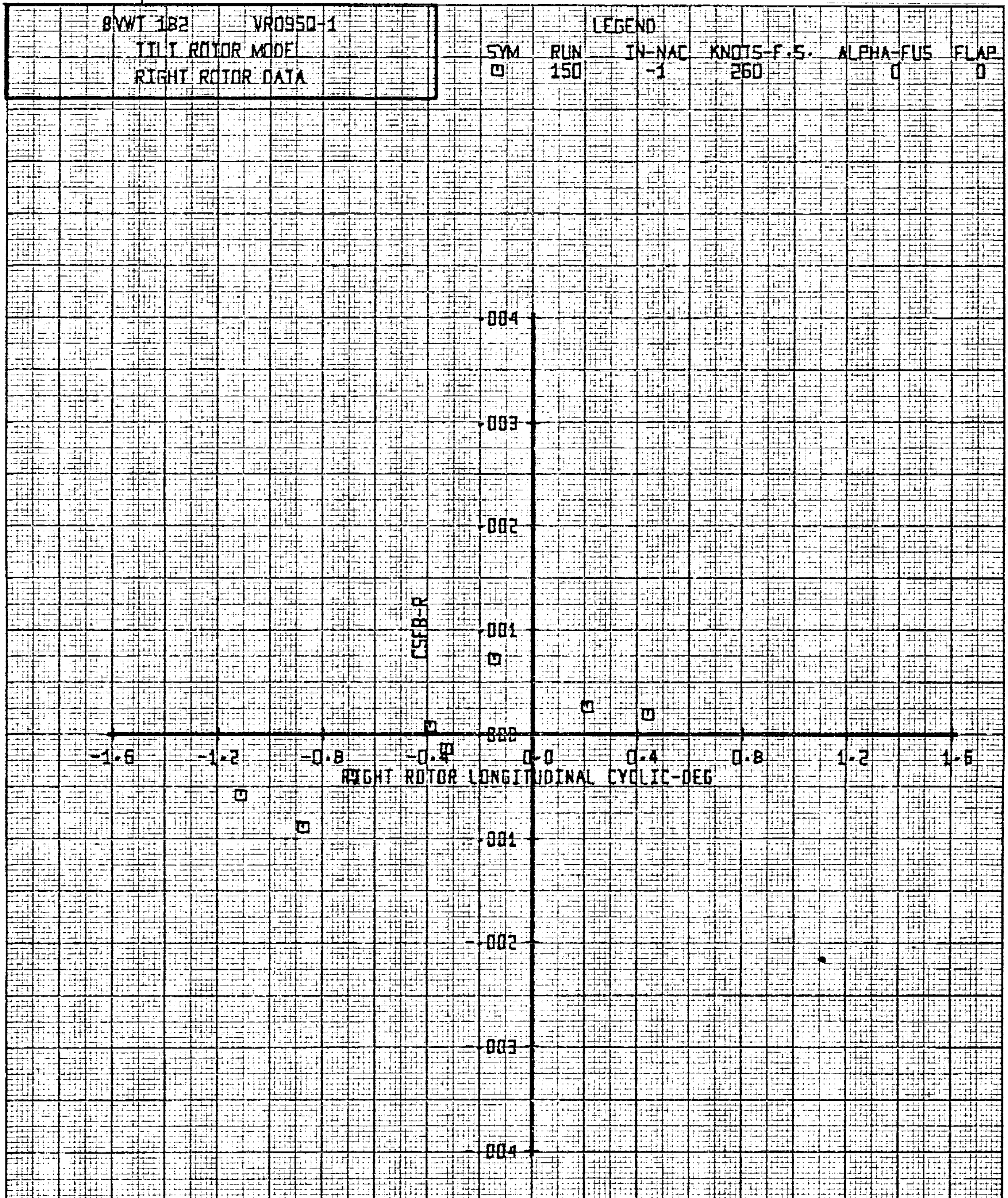


Figure 16-058. Right Rotor Side Force Coefficient Versus Right Rotor Long. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

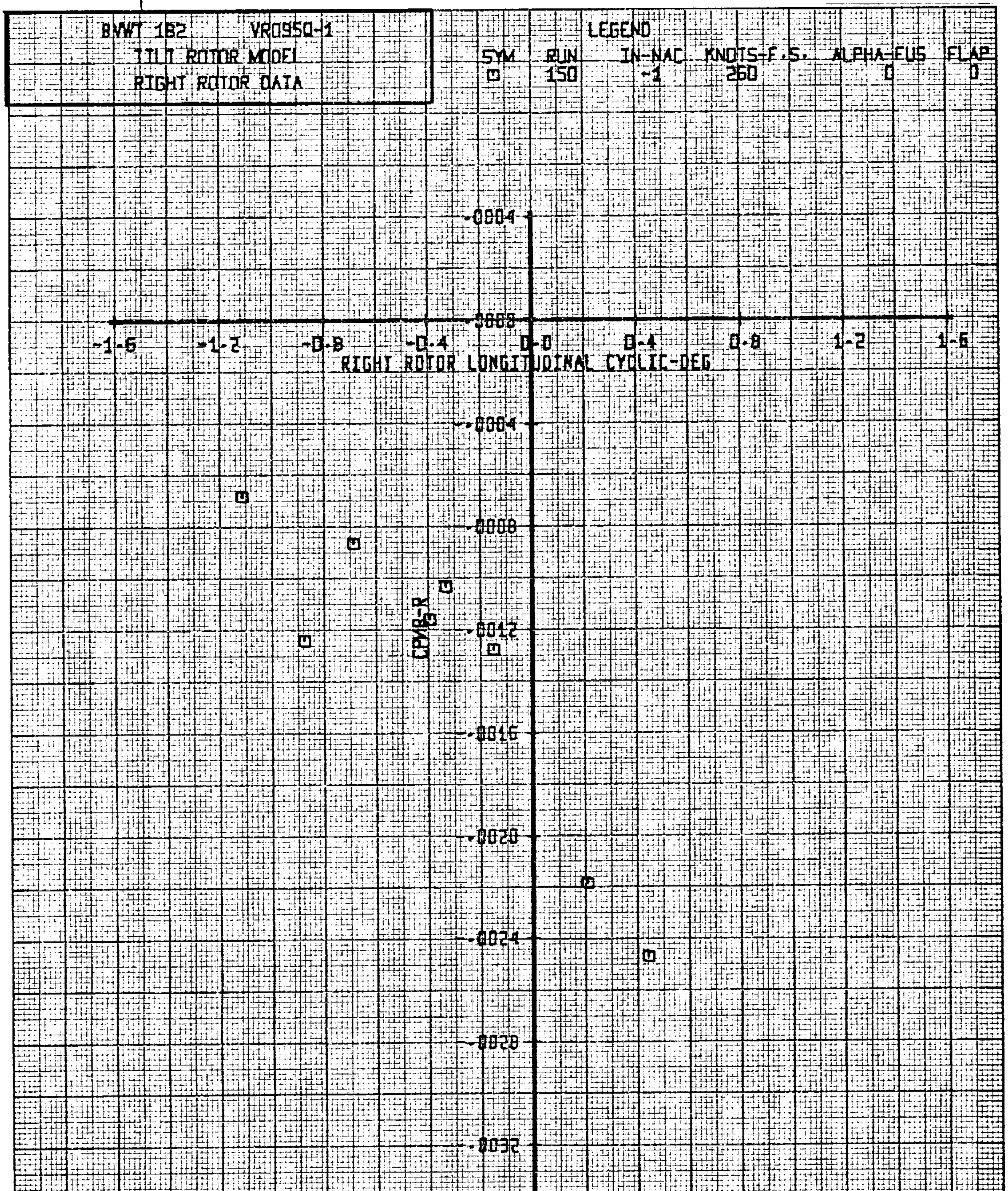


Figure 16-059. Right Rotor Pitching Moment Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

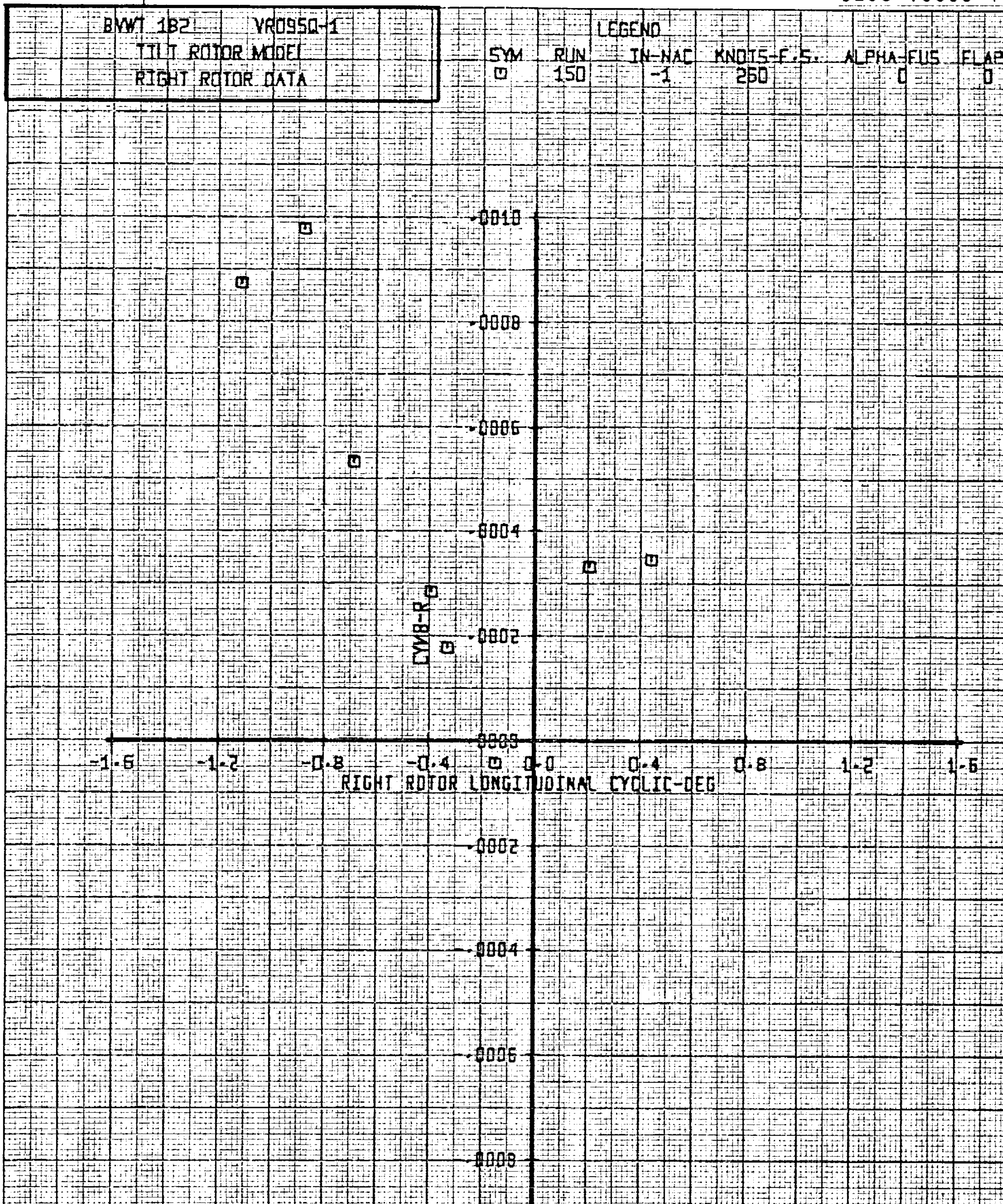
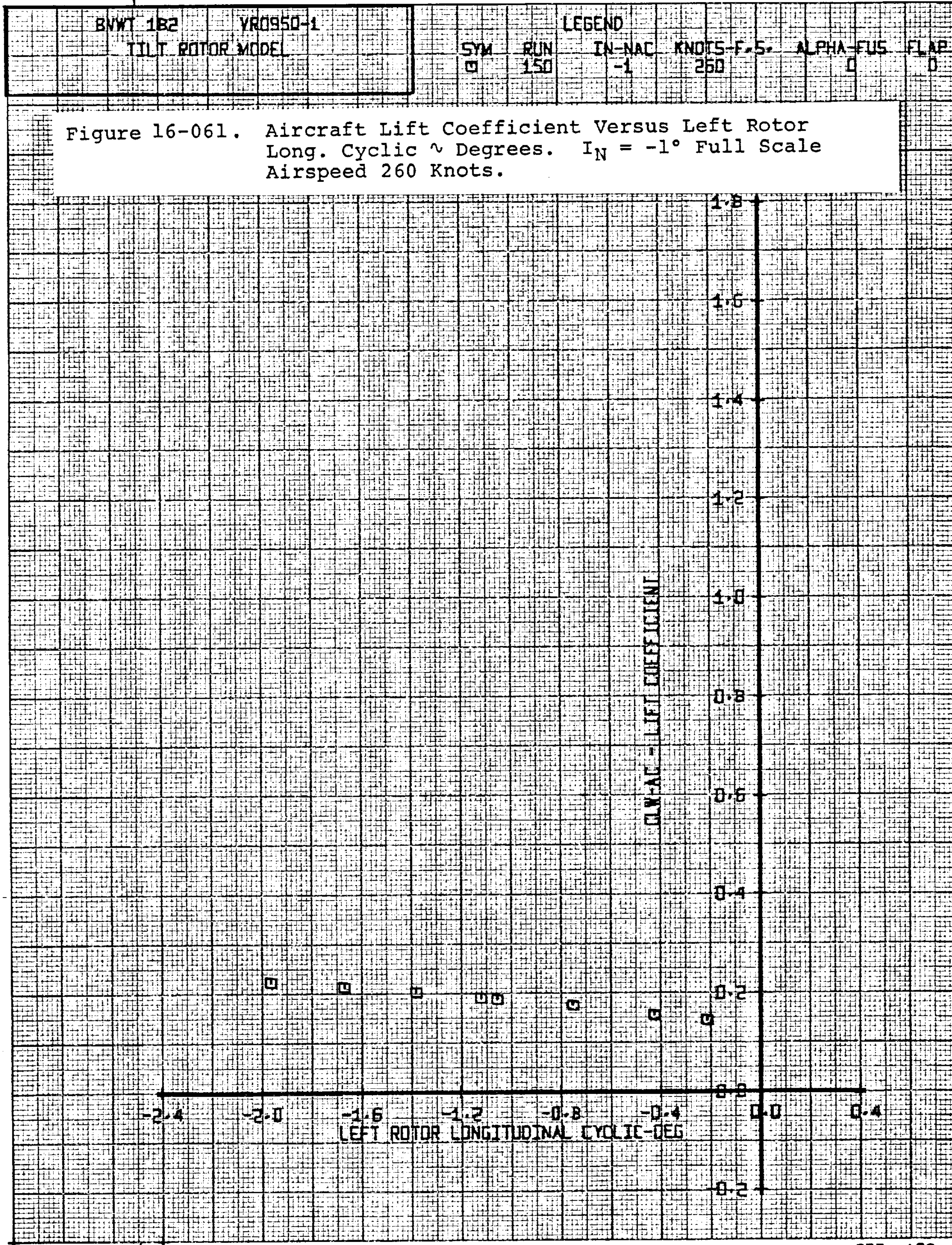


Figure 16-060. Right Rotor Yawing Moment Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

Figure 16-061. Aircraft Lift Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.



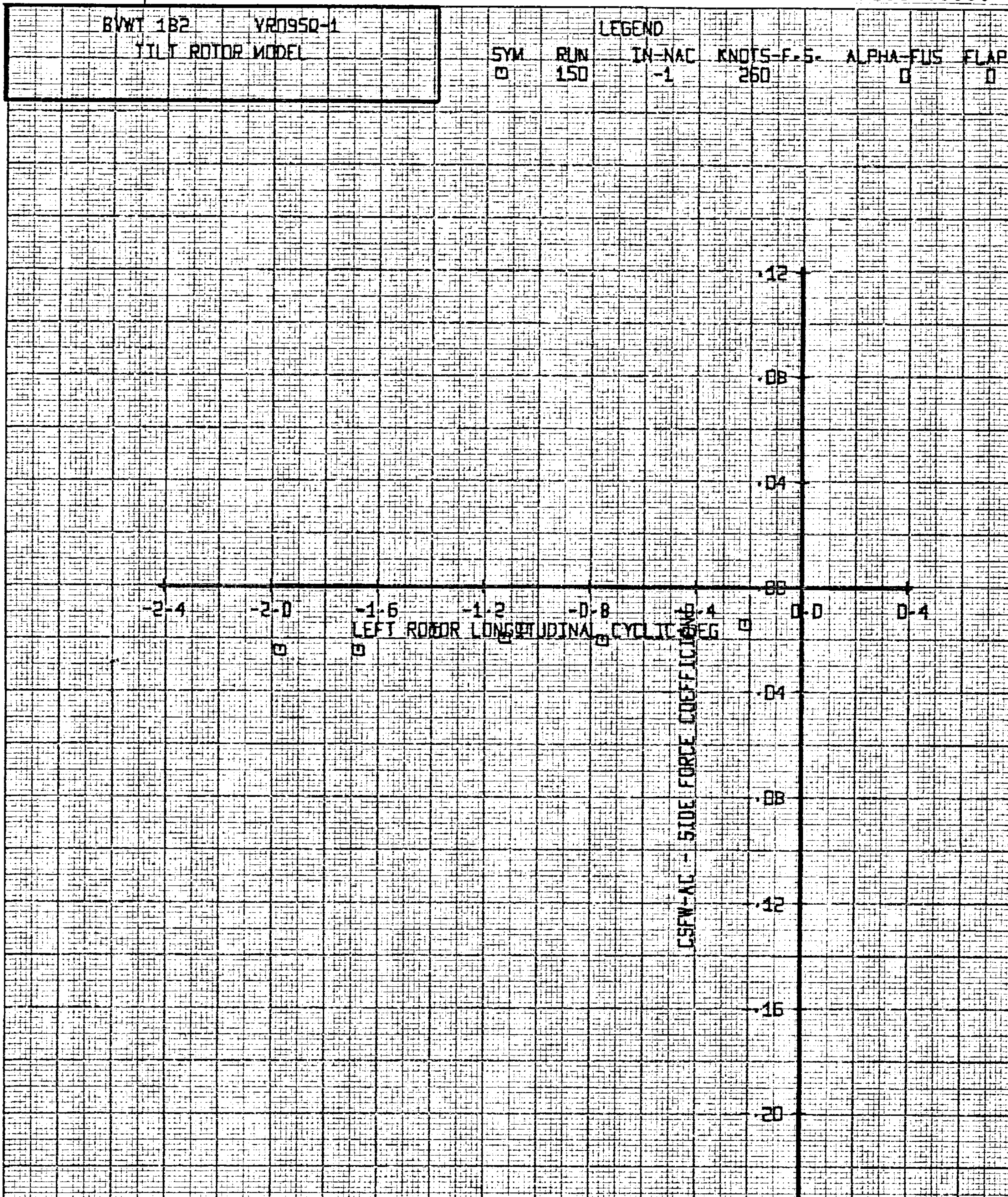


Figure 16-062. Aircraft Side Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

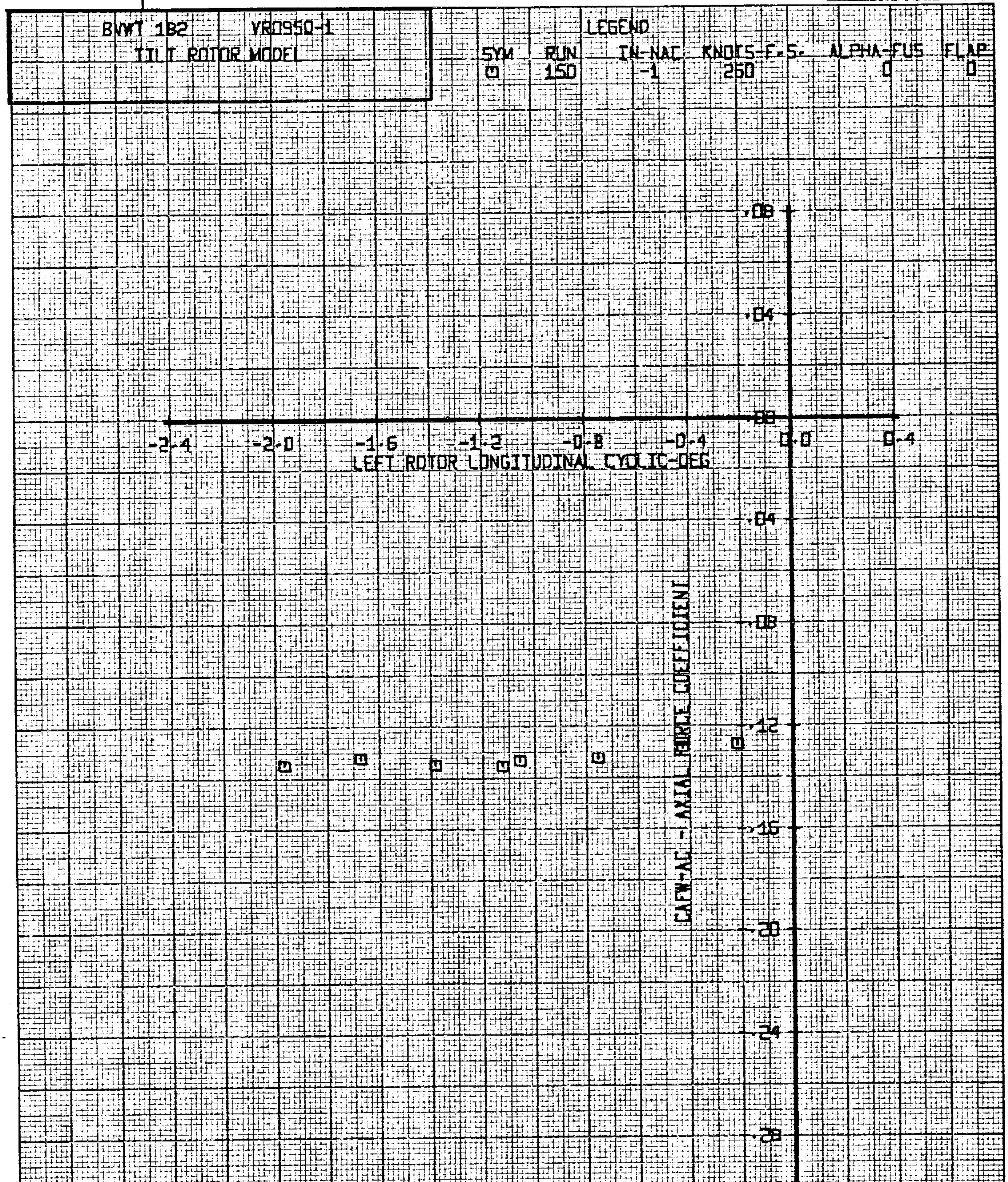


Figure 16-063. Aircraft Axial Force Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

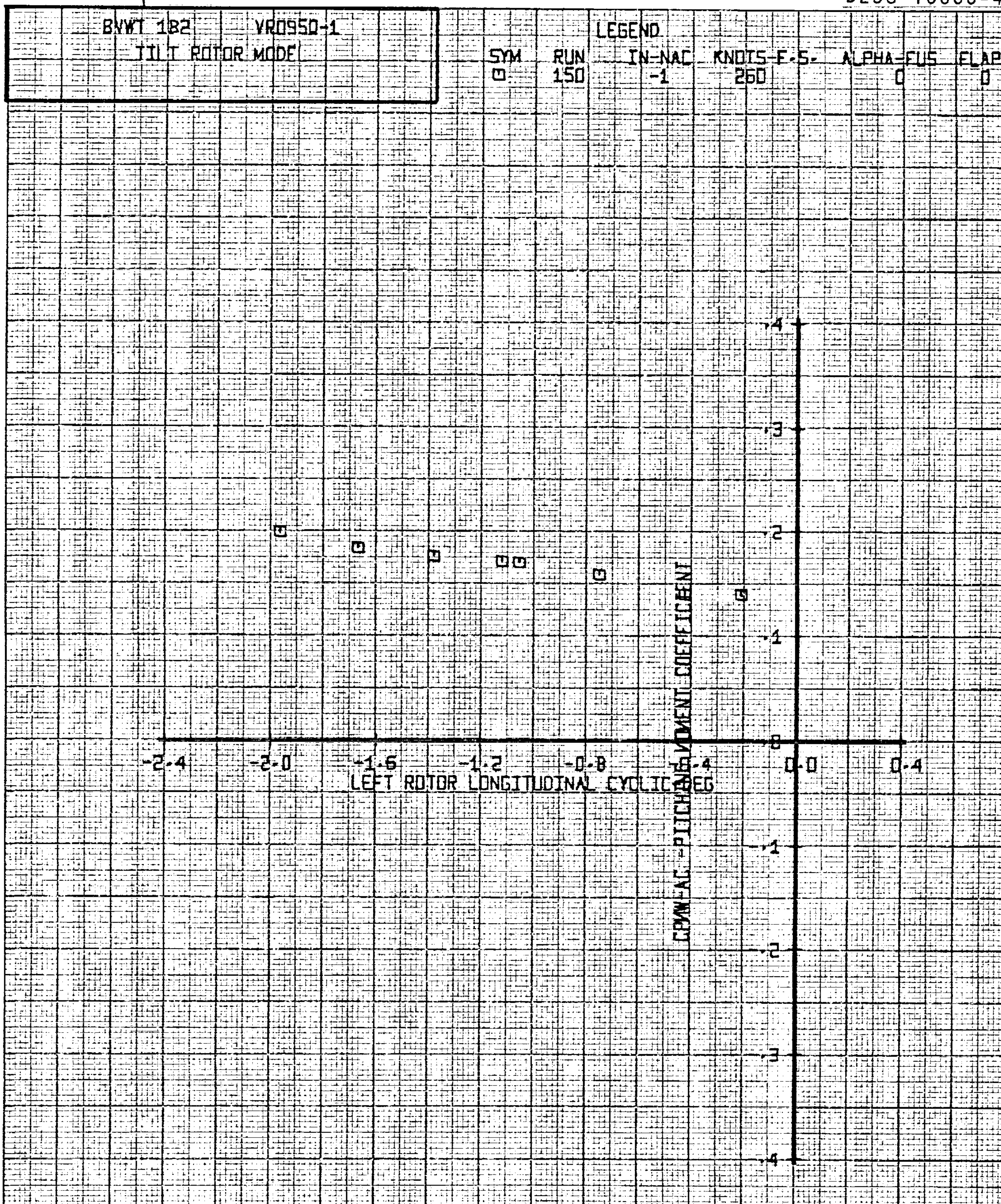


Figure 16-064. Aircraft Pitching Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

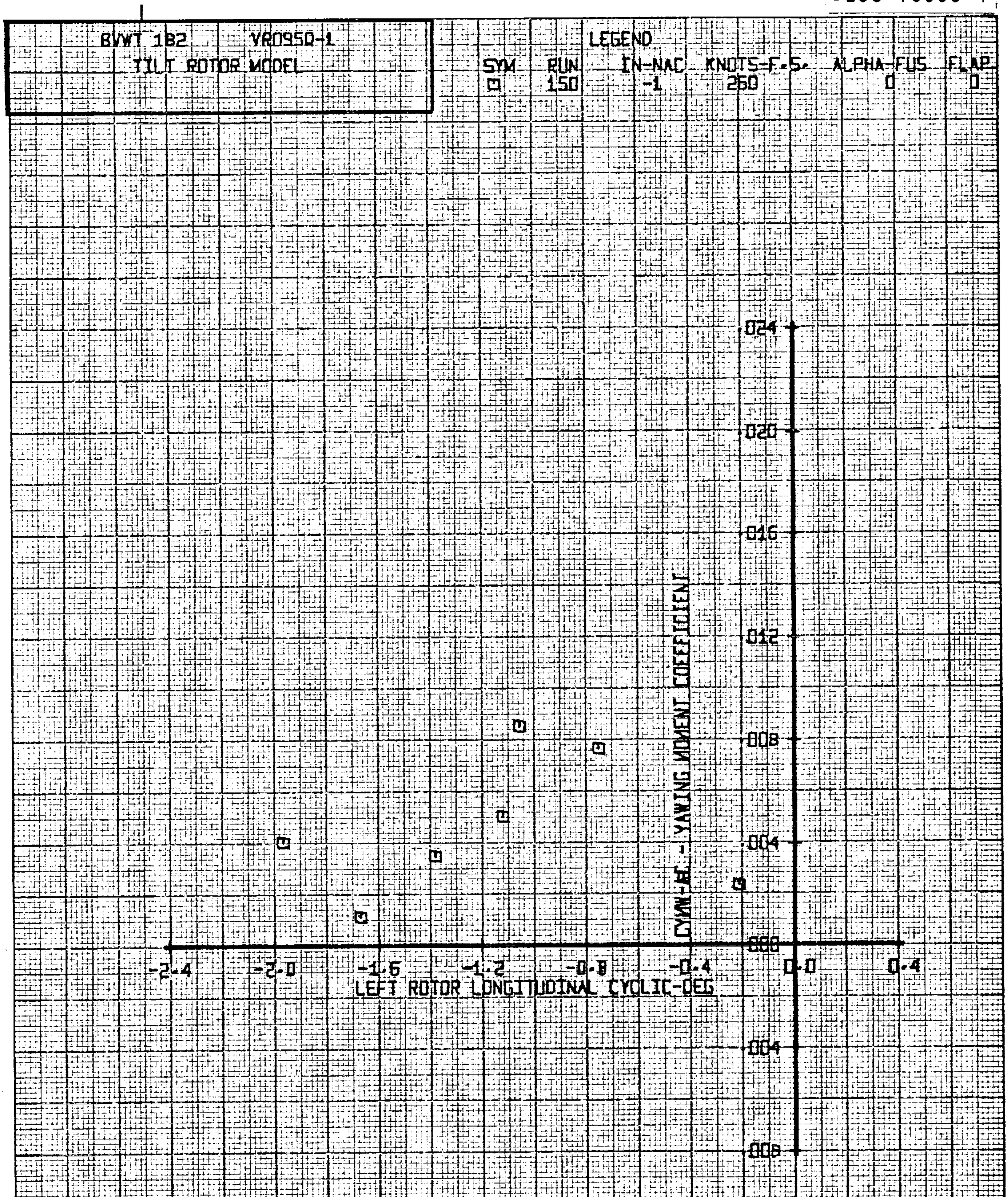


Figure 16-065. Aircraft Yawing Moment Coefficient Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

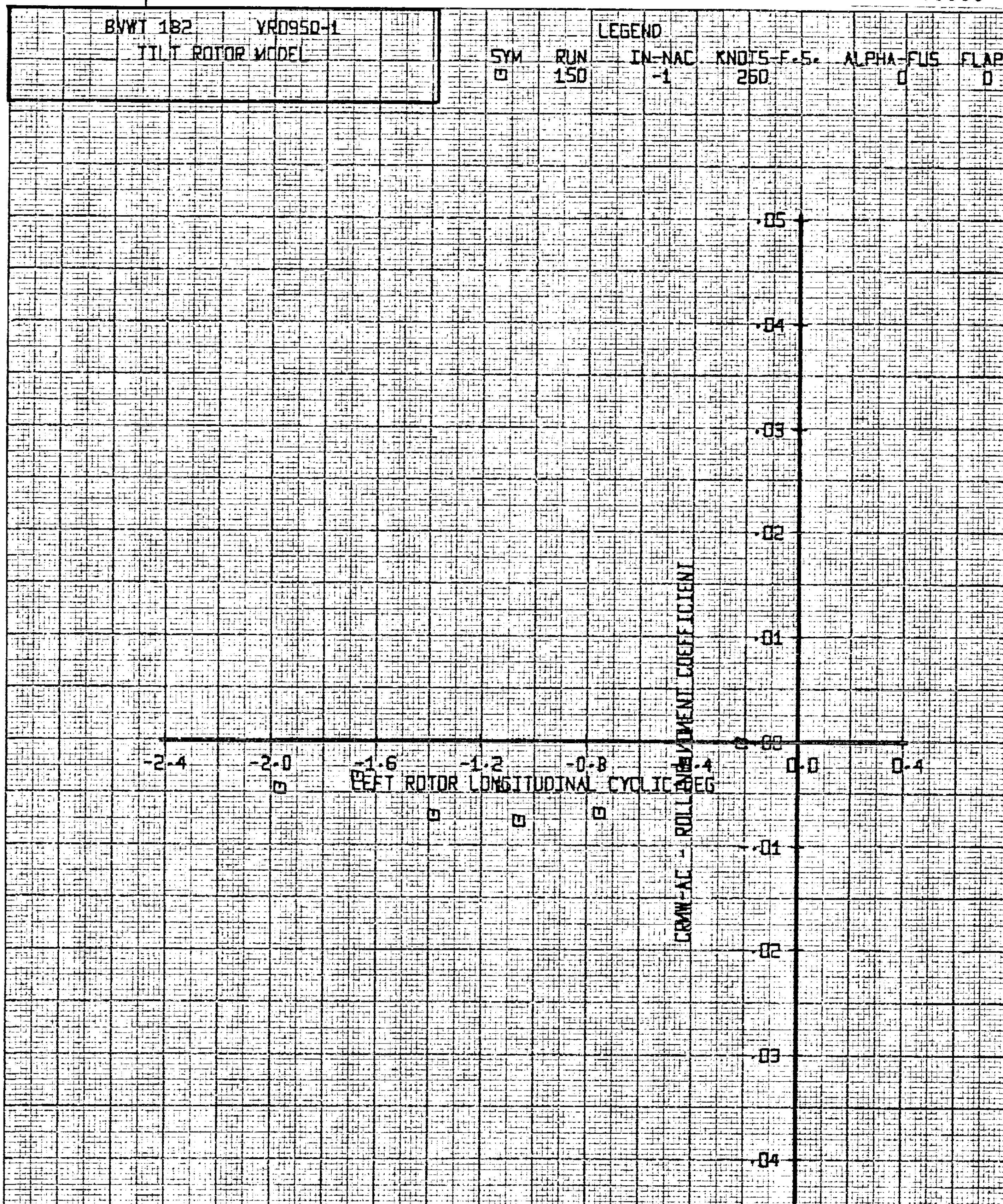


Figure 16-066. Aircraft Rolling Moment Coefficient Versus Left Rotor Long. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

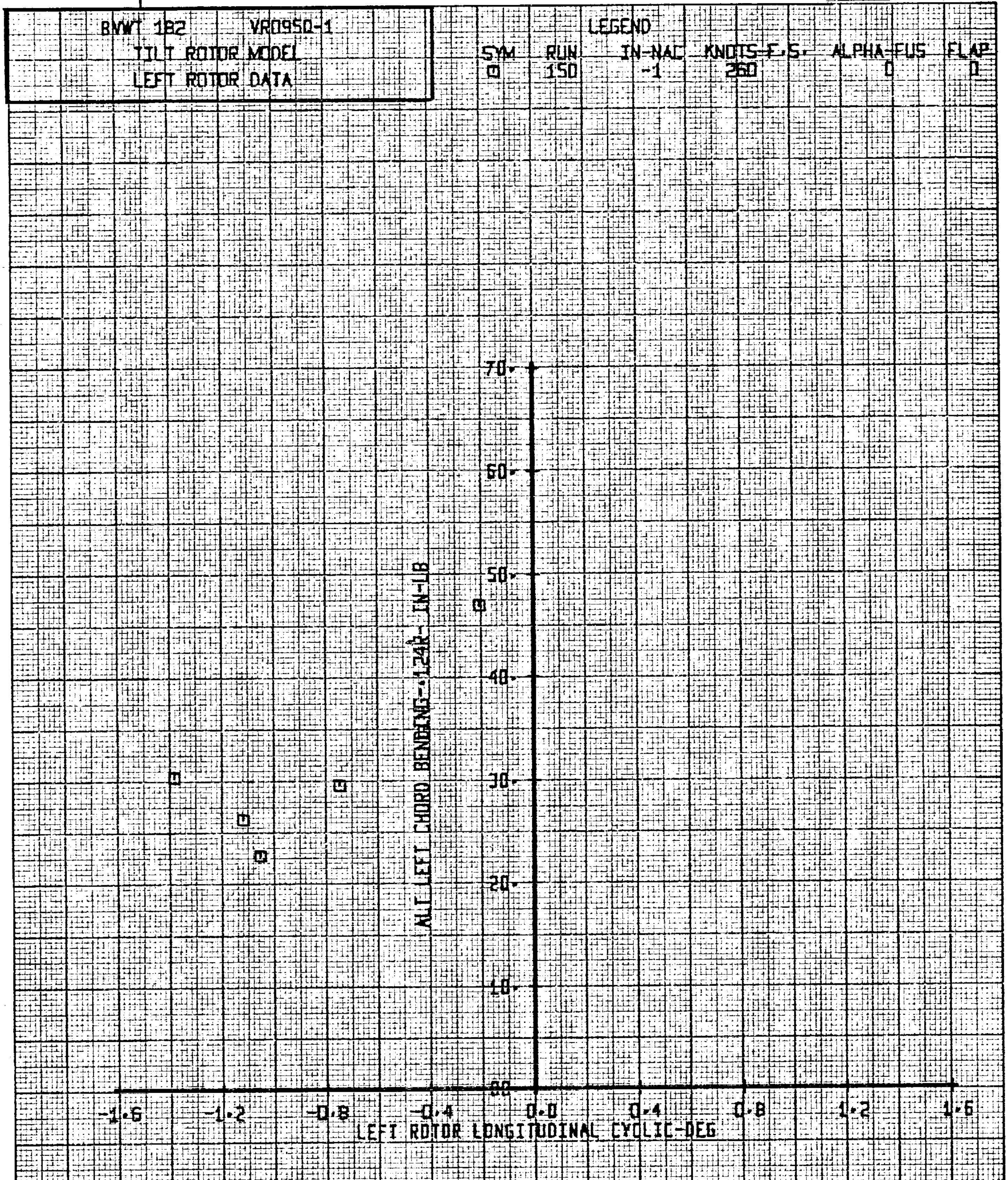


Figure 16-067. Alt. Left Chord Bending Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

Figure 16-068. Alt. Left Flap Bending Versus Left Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

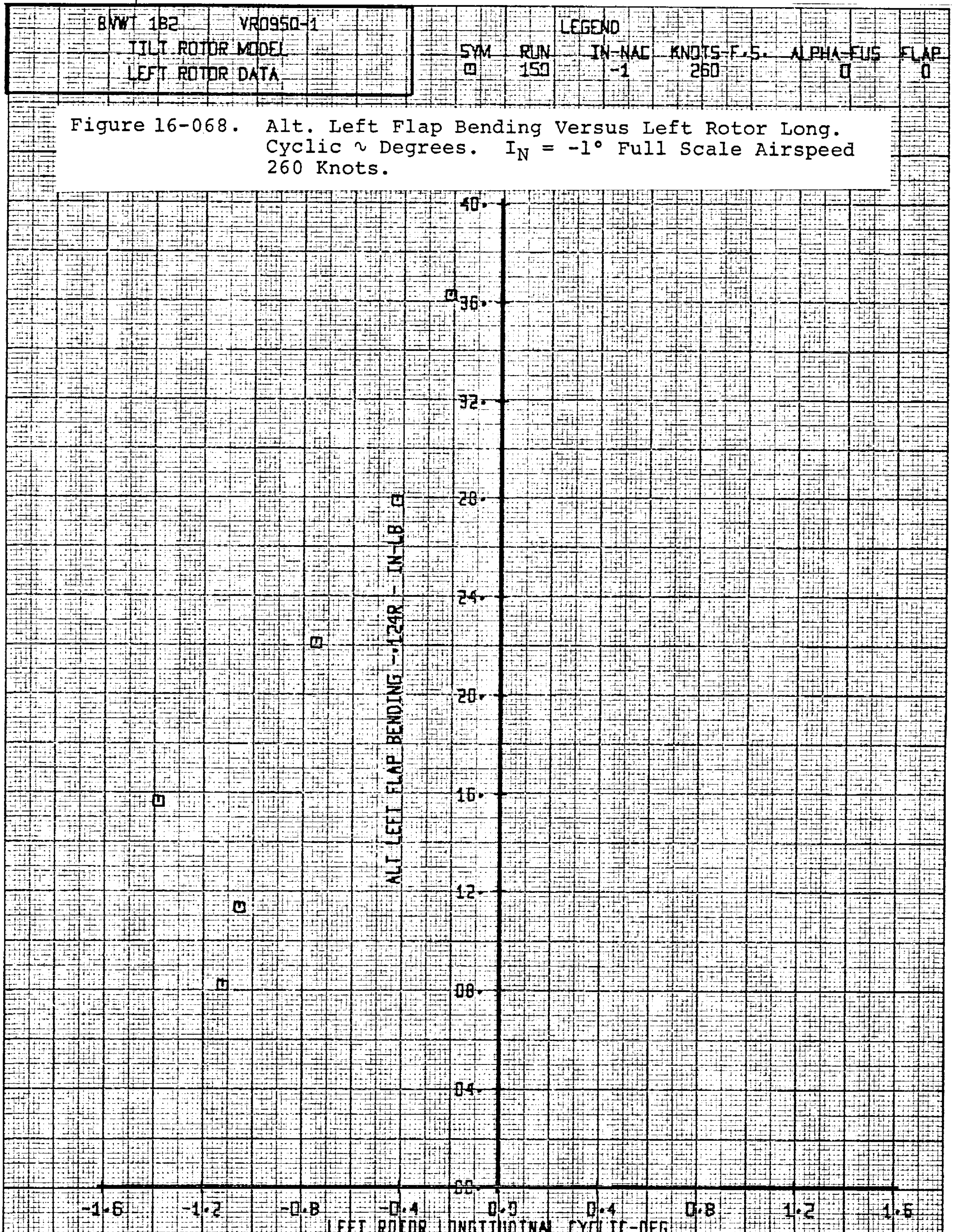


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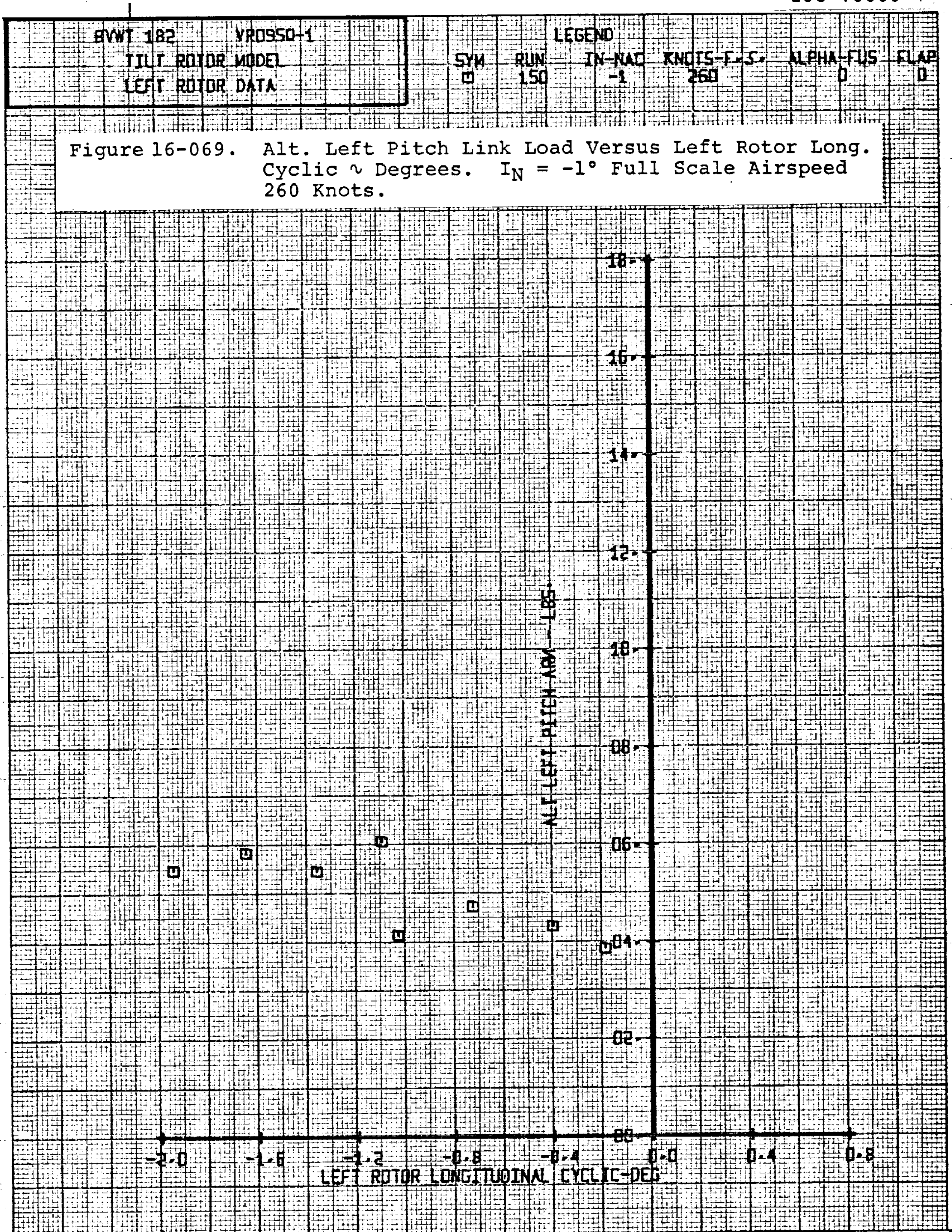
Figure 16-069. Alt. Left Pitch Link Load Versus Left Rotor Long. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.



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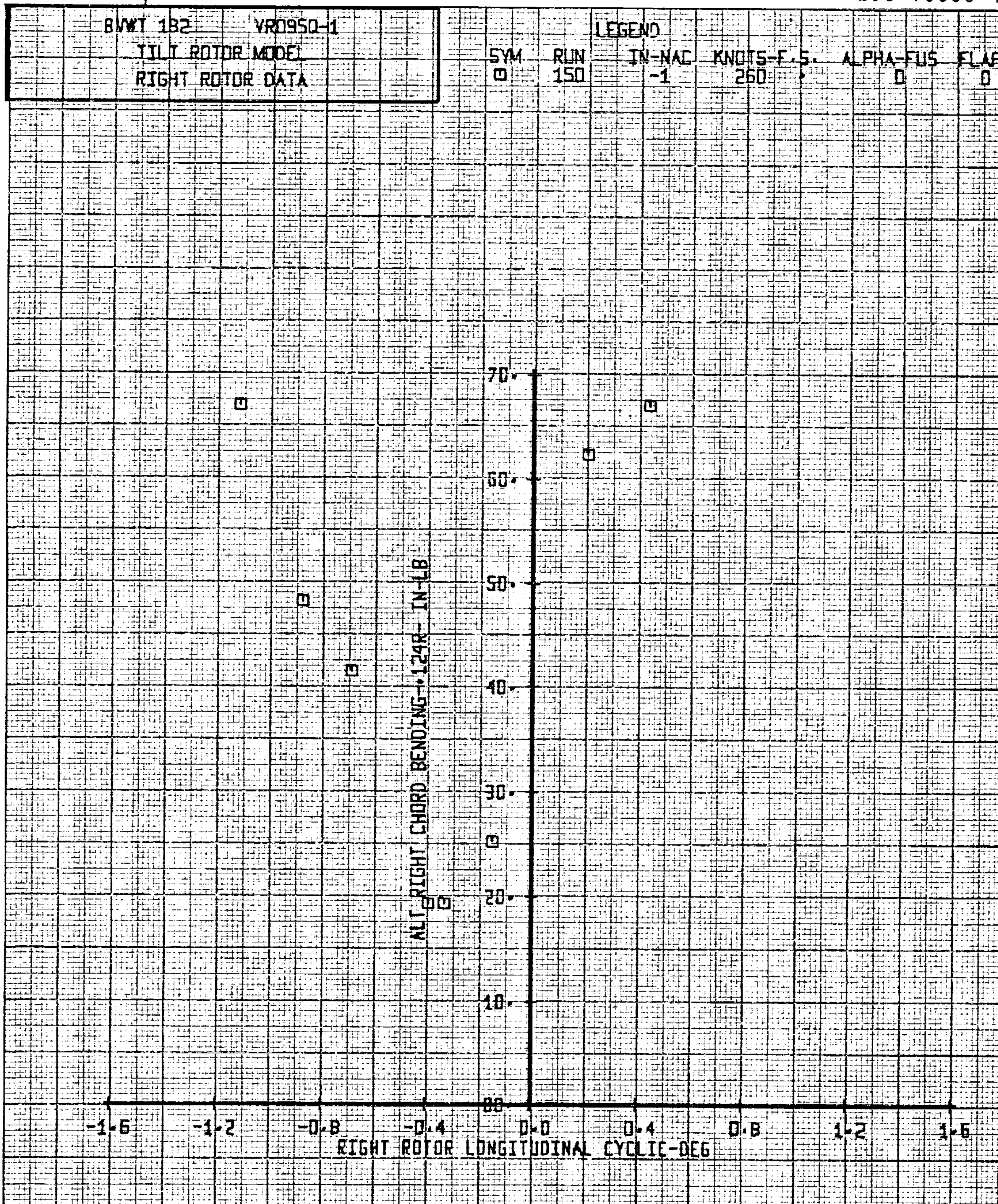
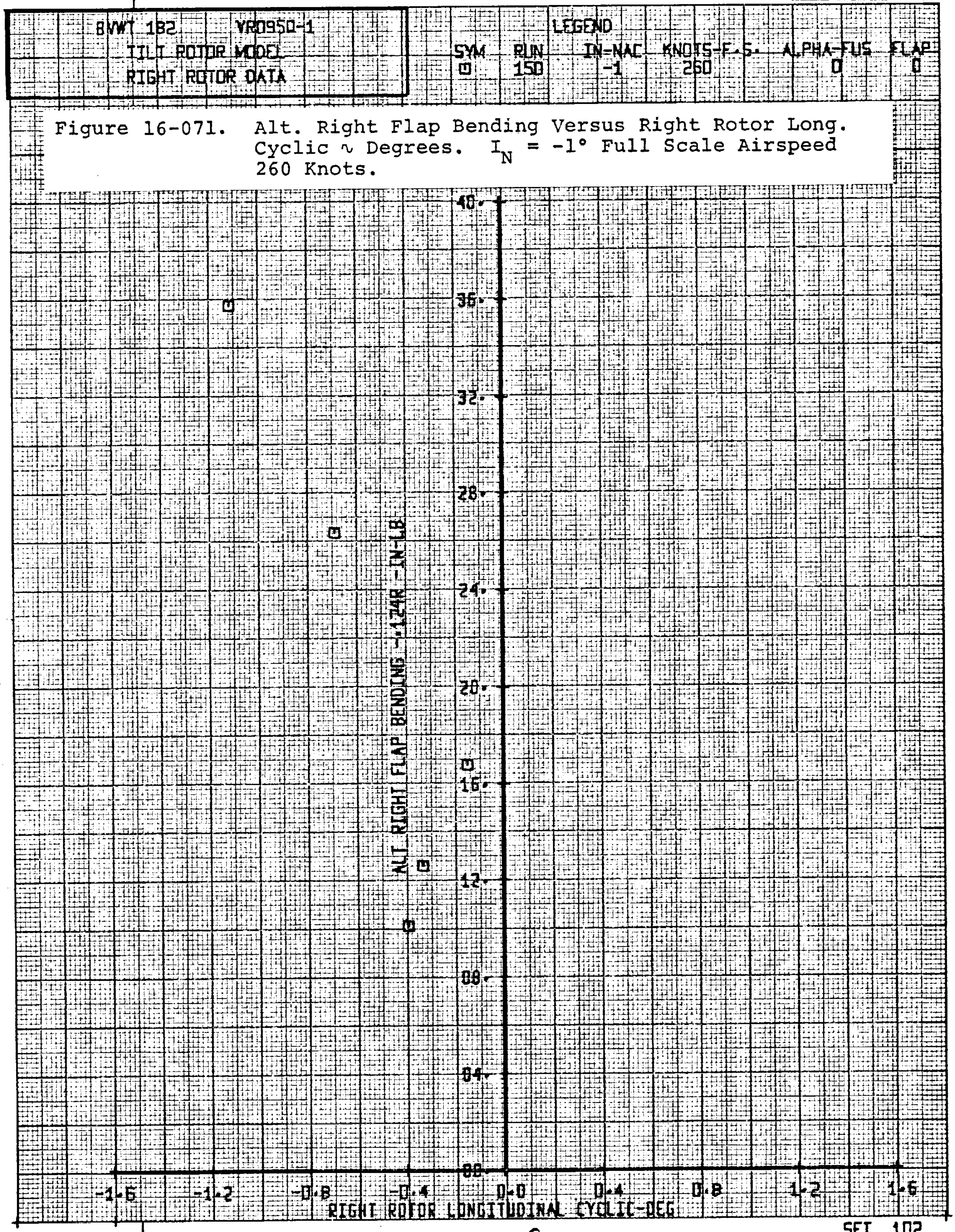


Figure 16-070. Alt. Right Chord Bending Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

Figure 16-071. Alt. Right Flap Bending Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.



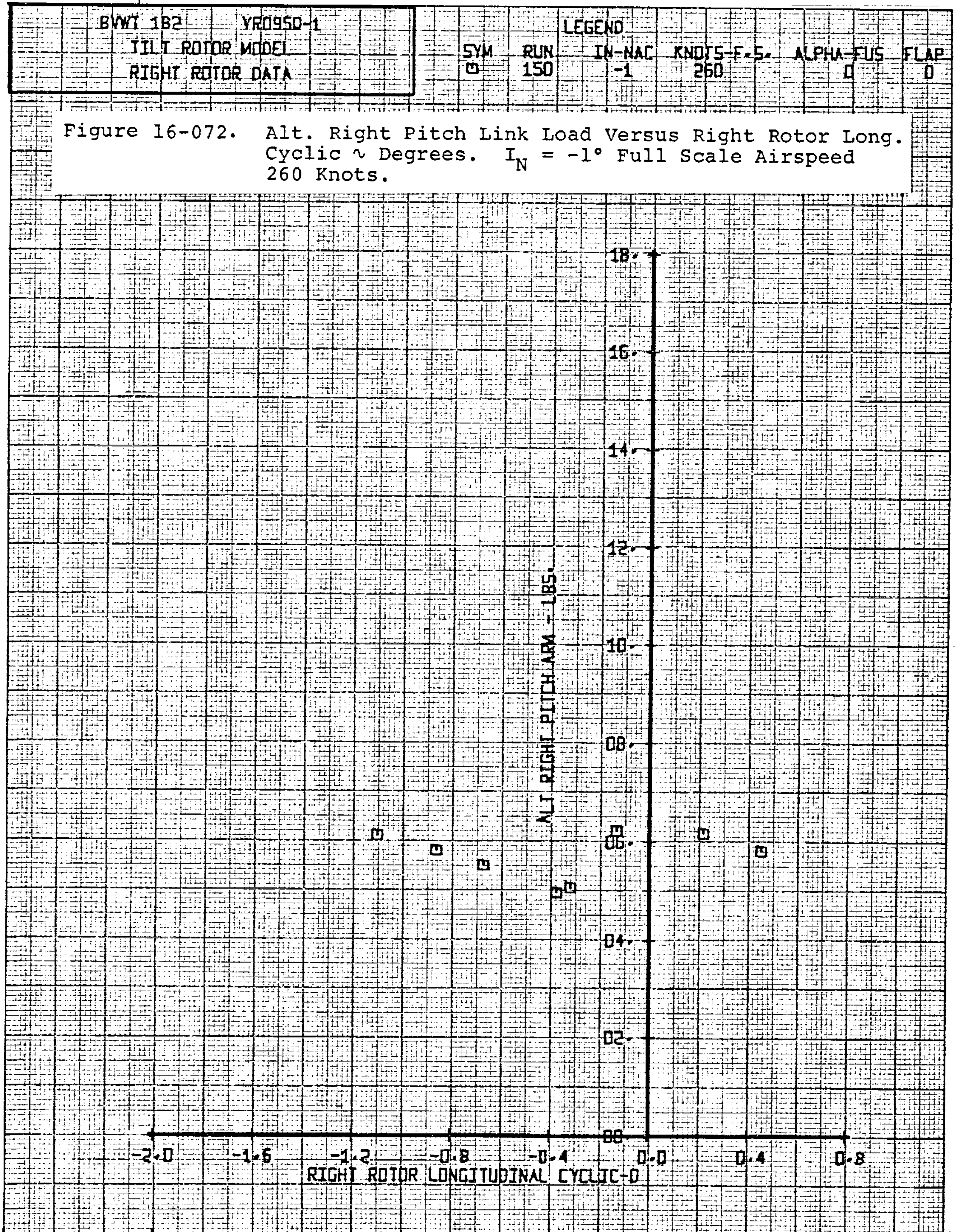
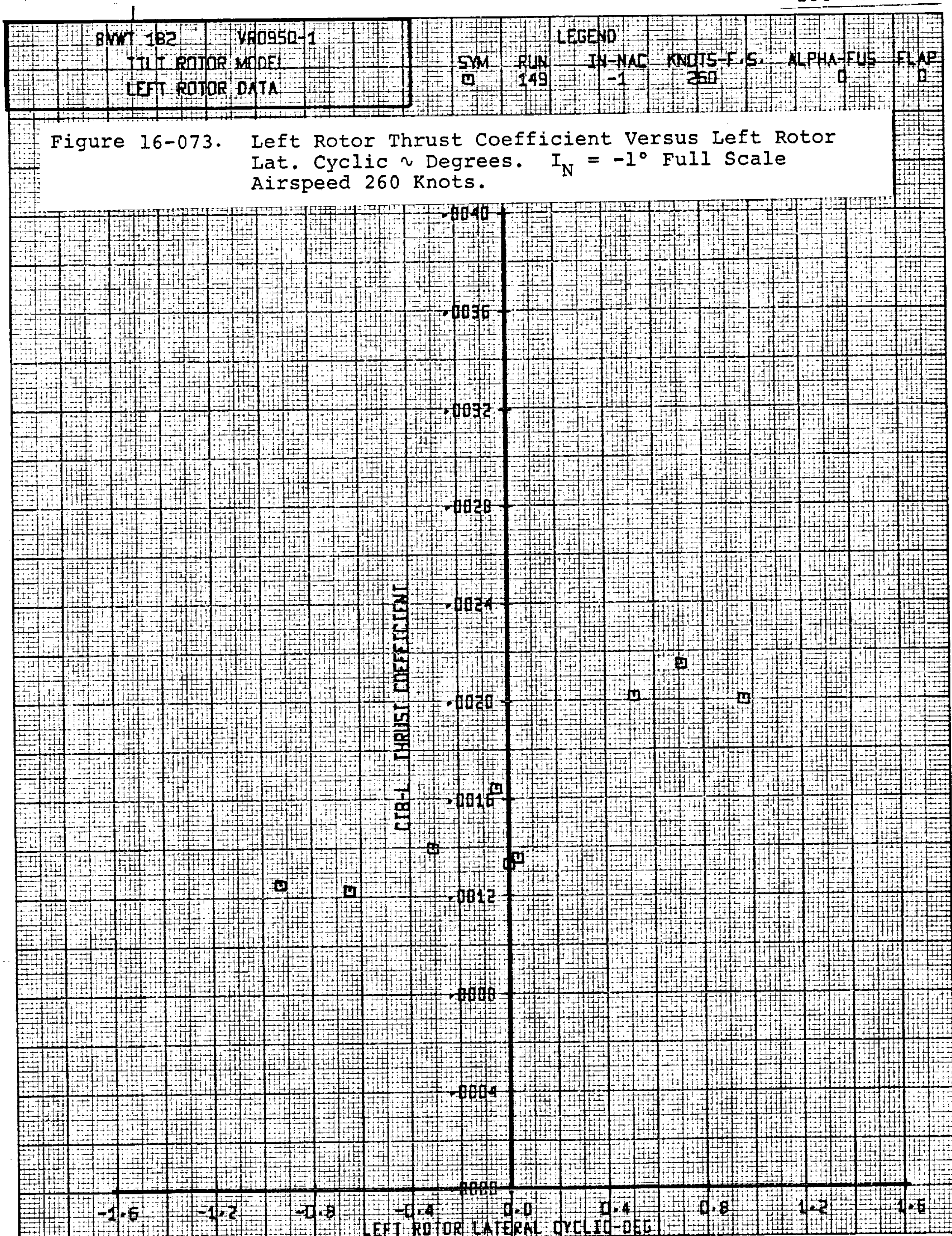


Figure 16-072. Alt. Right Pitch Link Load Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

Figure 16-073. Left Rotor Thrust Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.



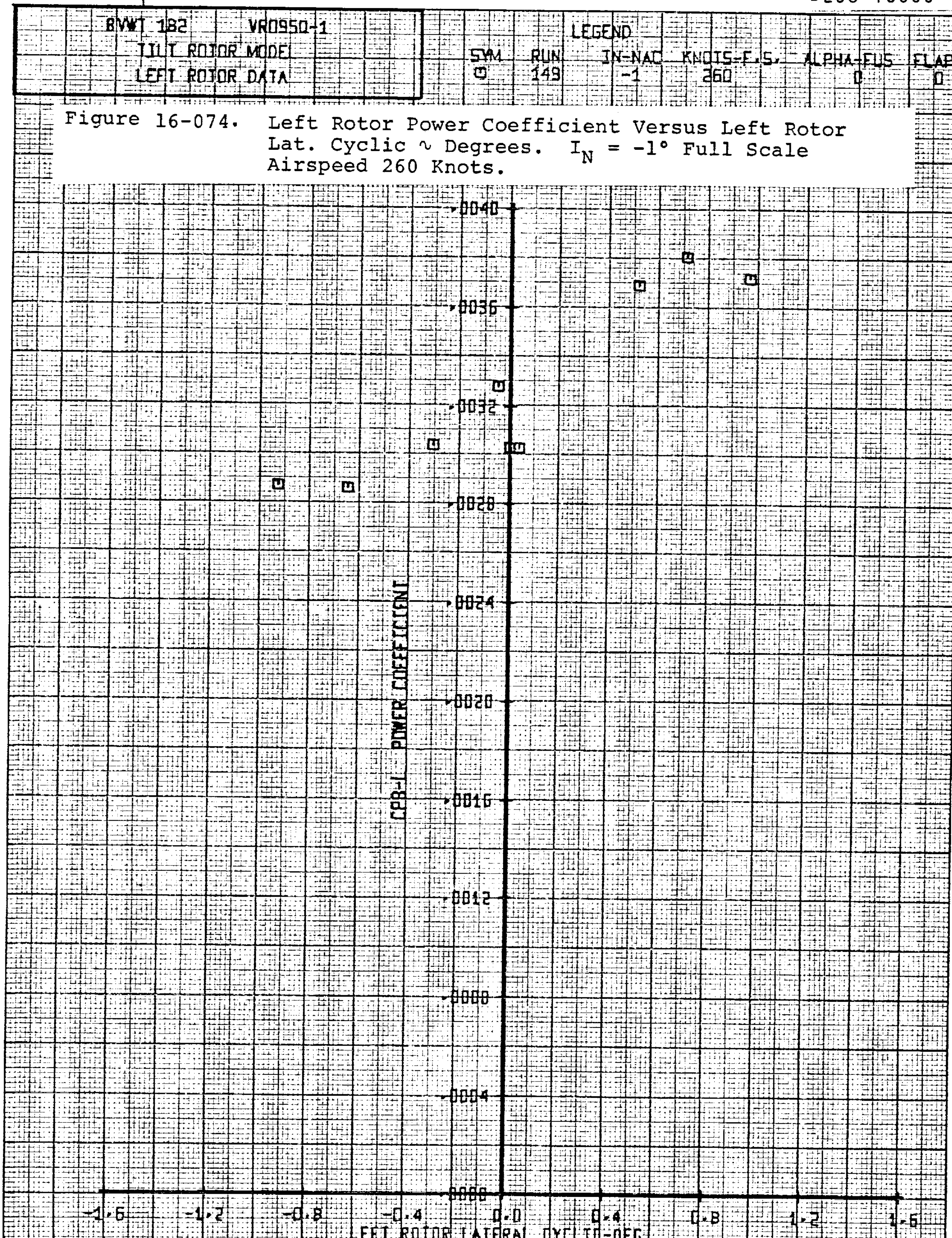


Figure 16-074. Left Rotor Power Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

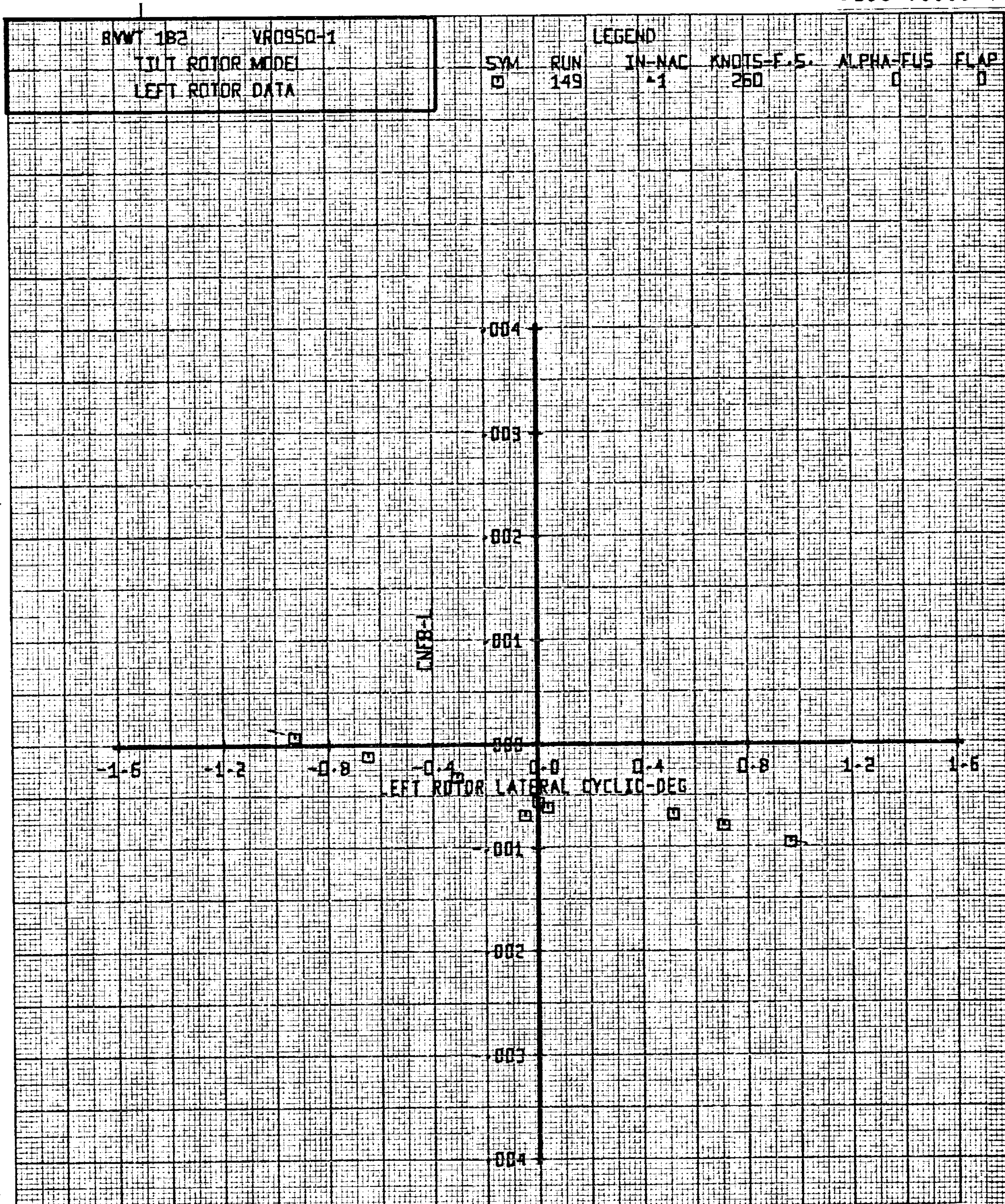


Figure 16-075. Left Rotor Normal Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

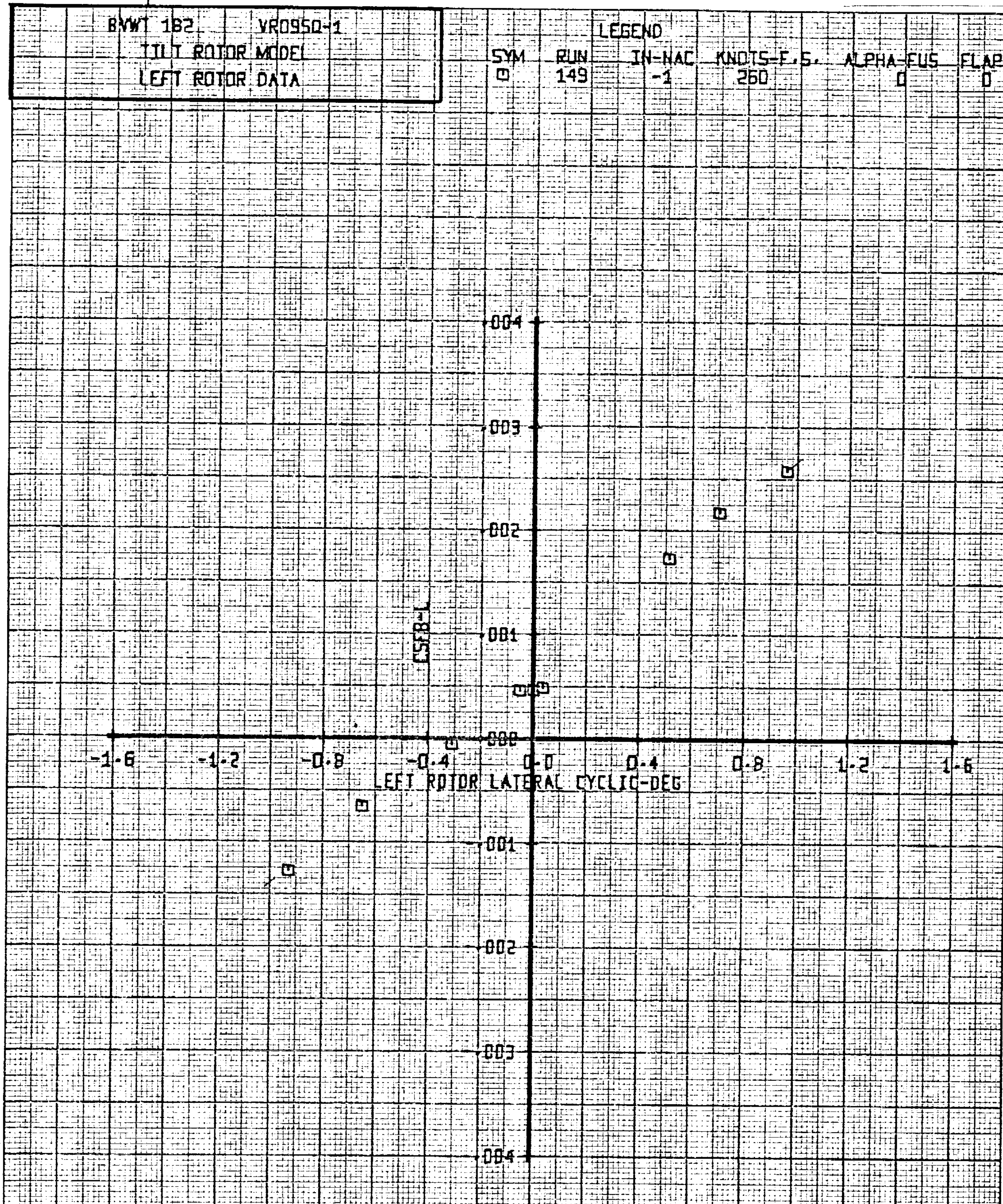


Figure 16-076. Left Rotor Side Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

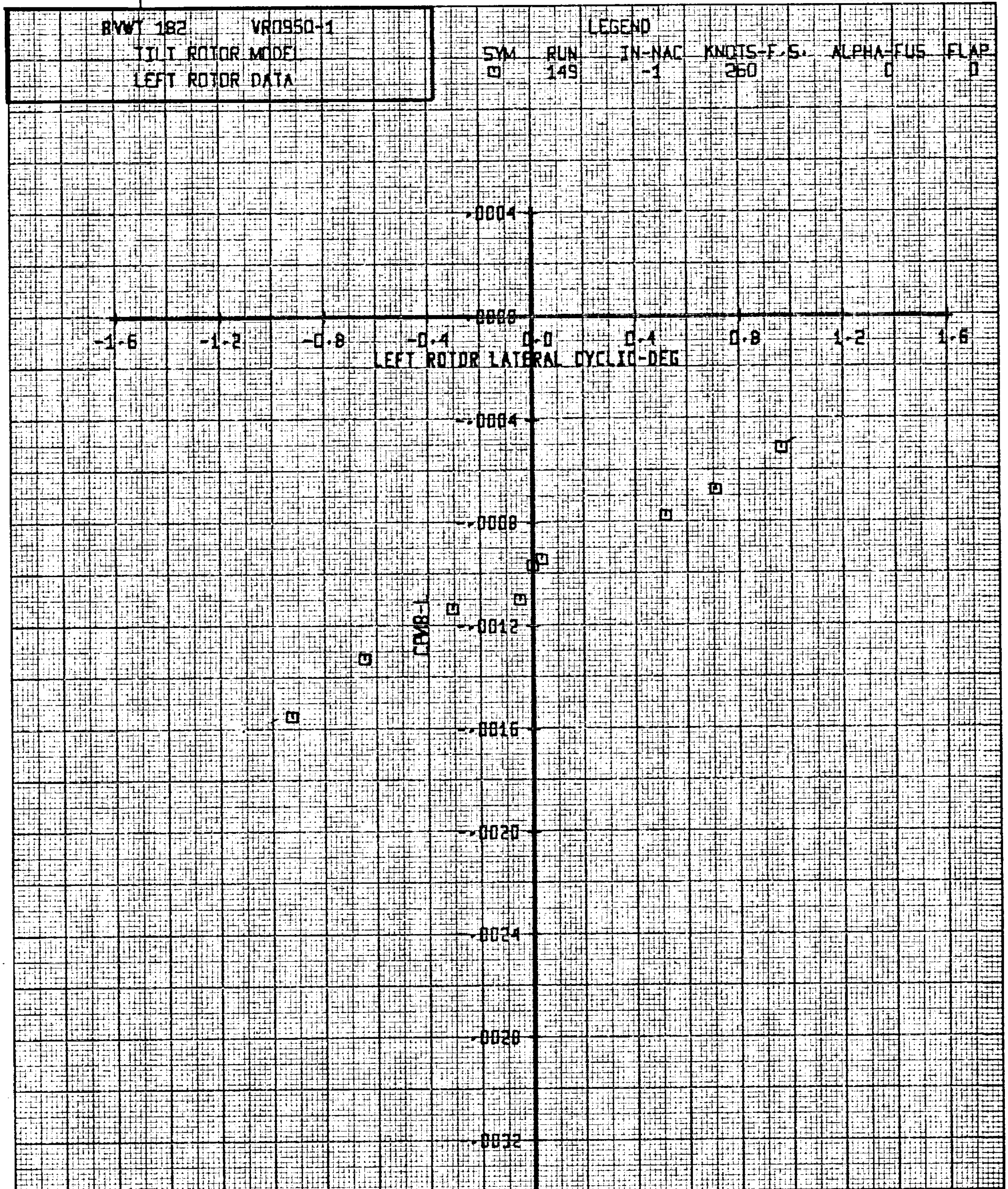


Figure 16-077. Left Rotor Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

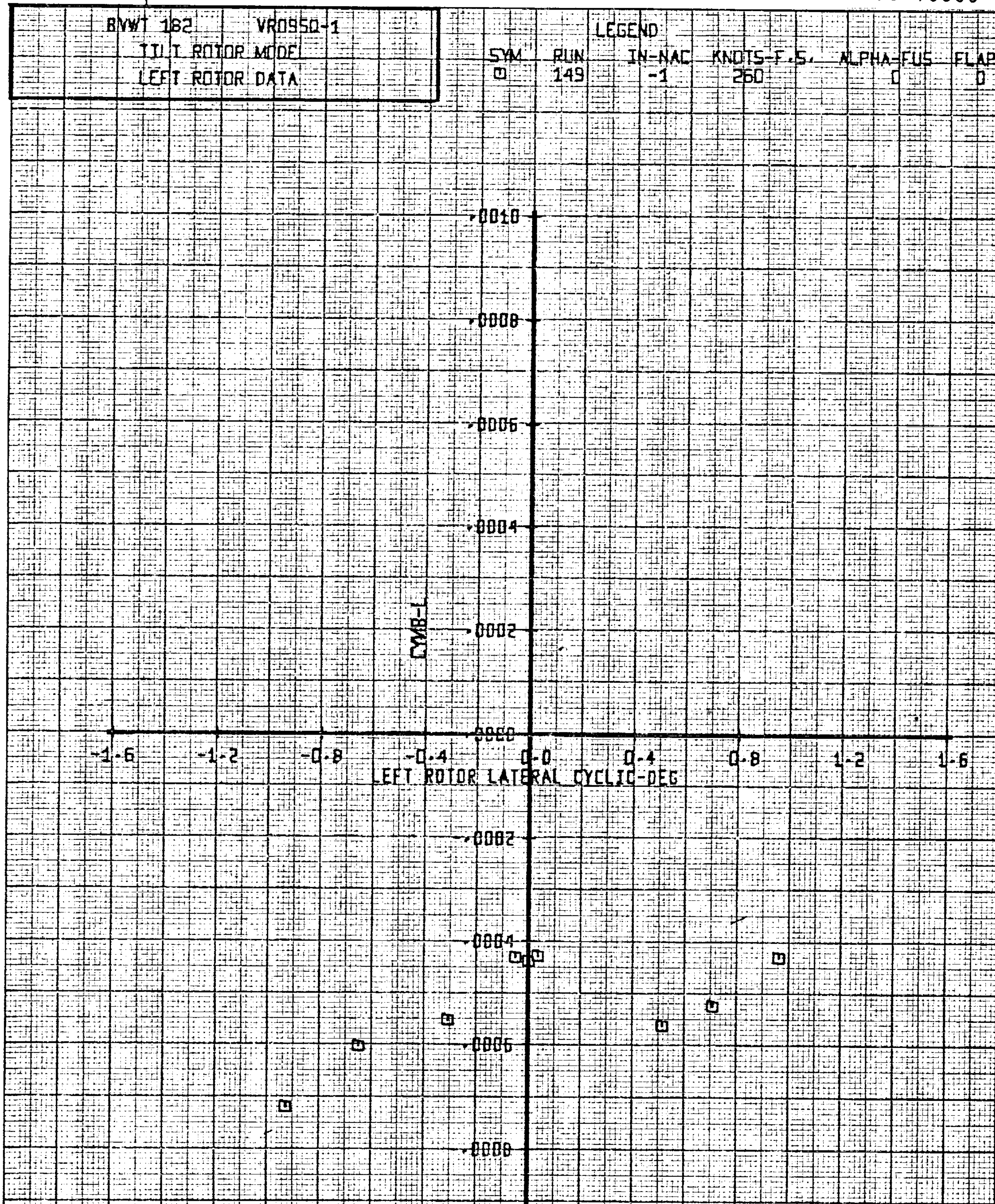
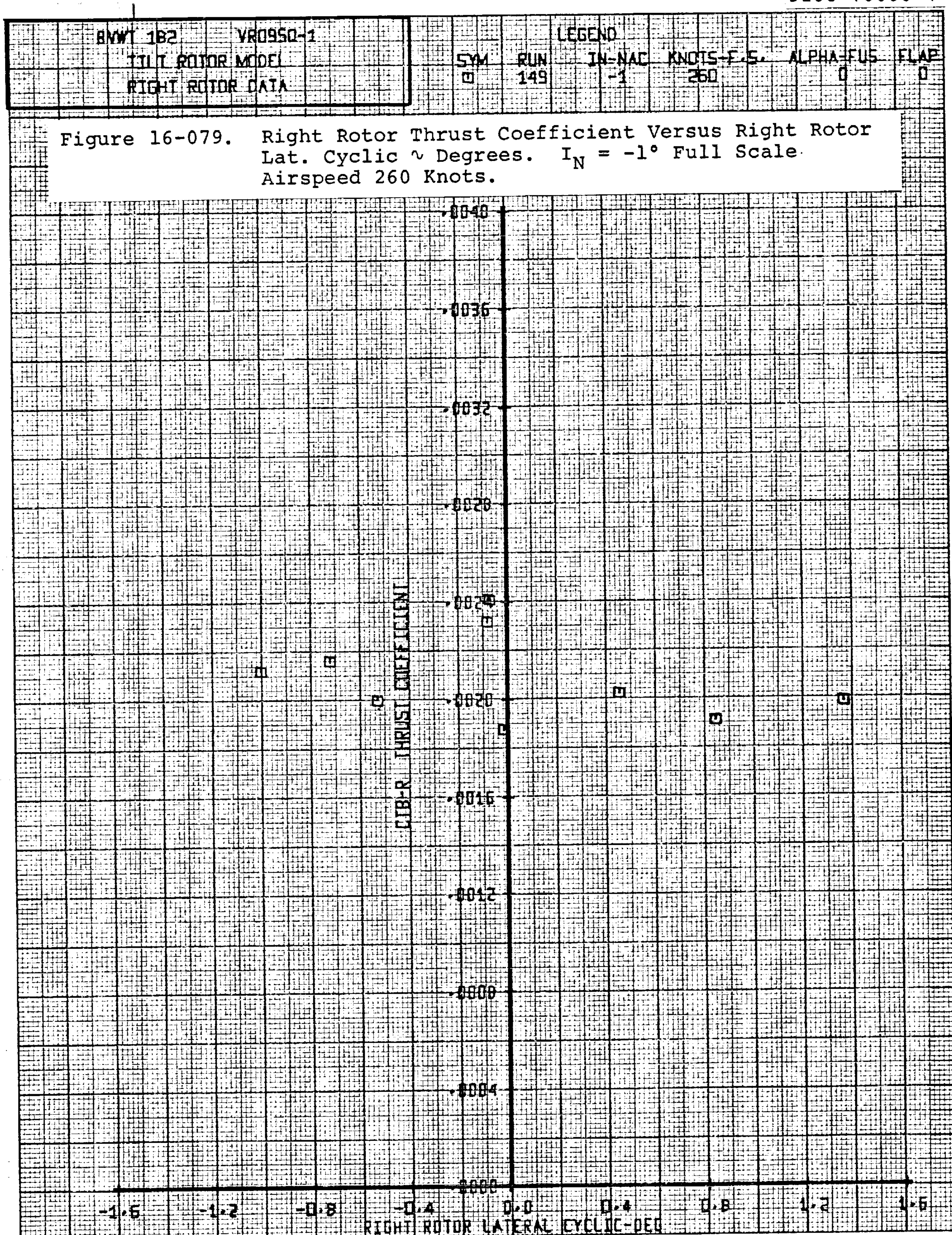


Figure 16-078. Left Rotor Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

Figure 16-079. Right Rotor Thrust Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.



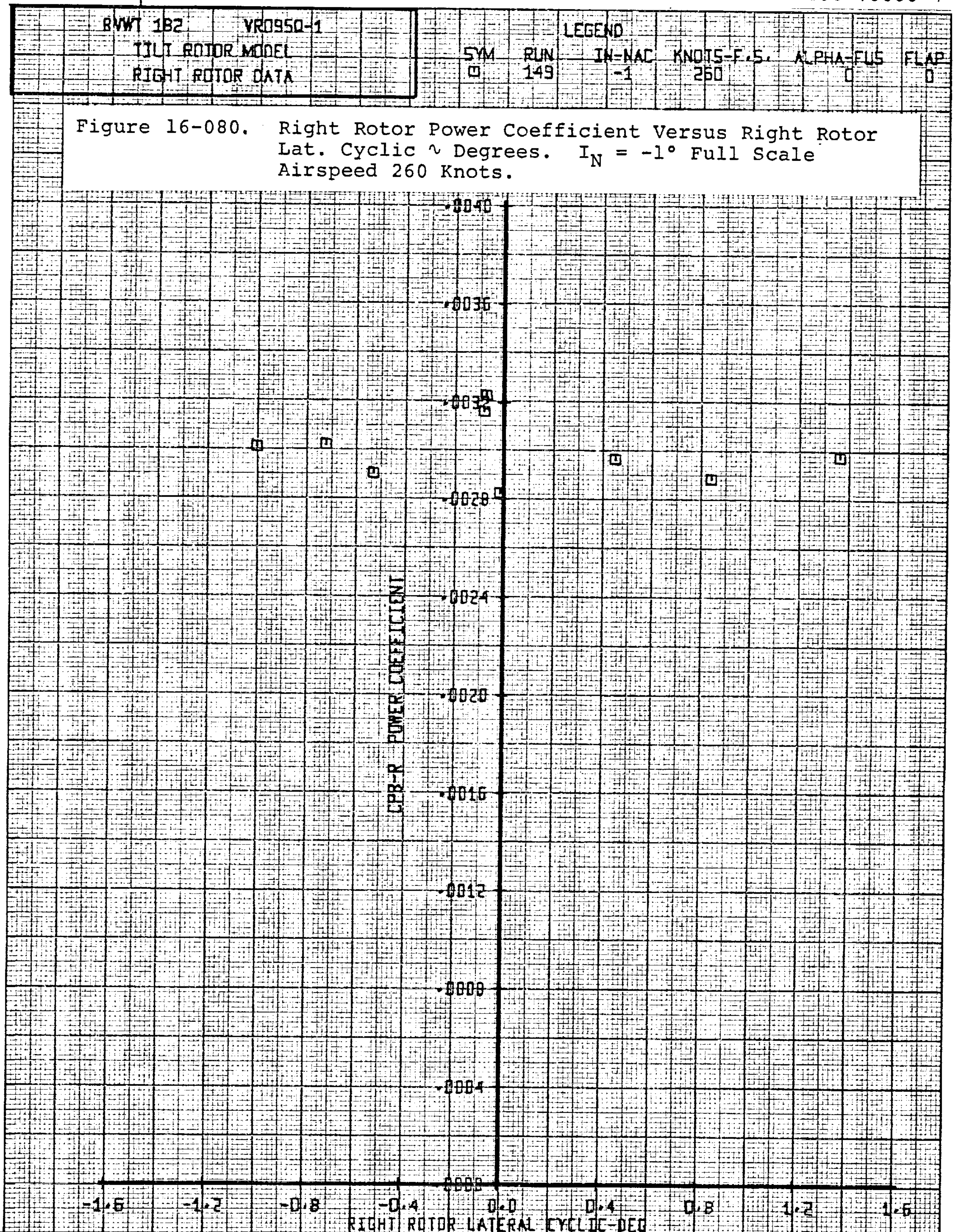


Figure 16-080. Right Rotor Power Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

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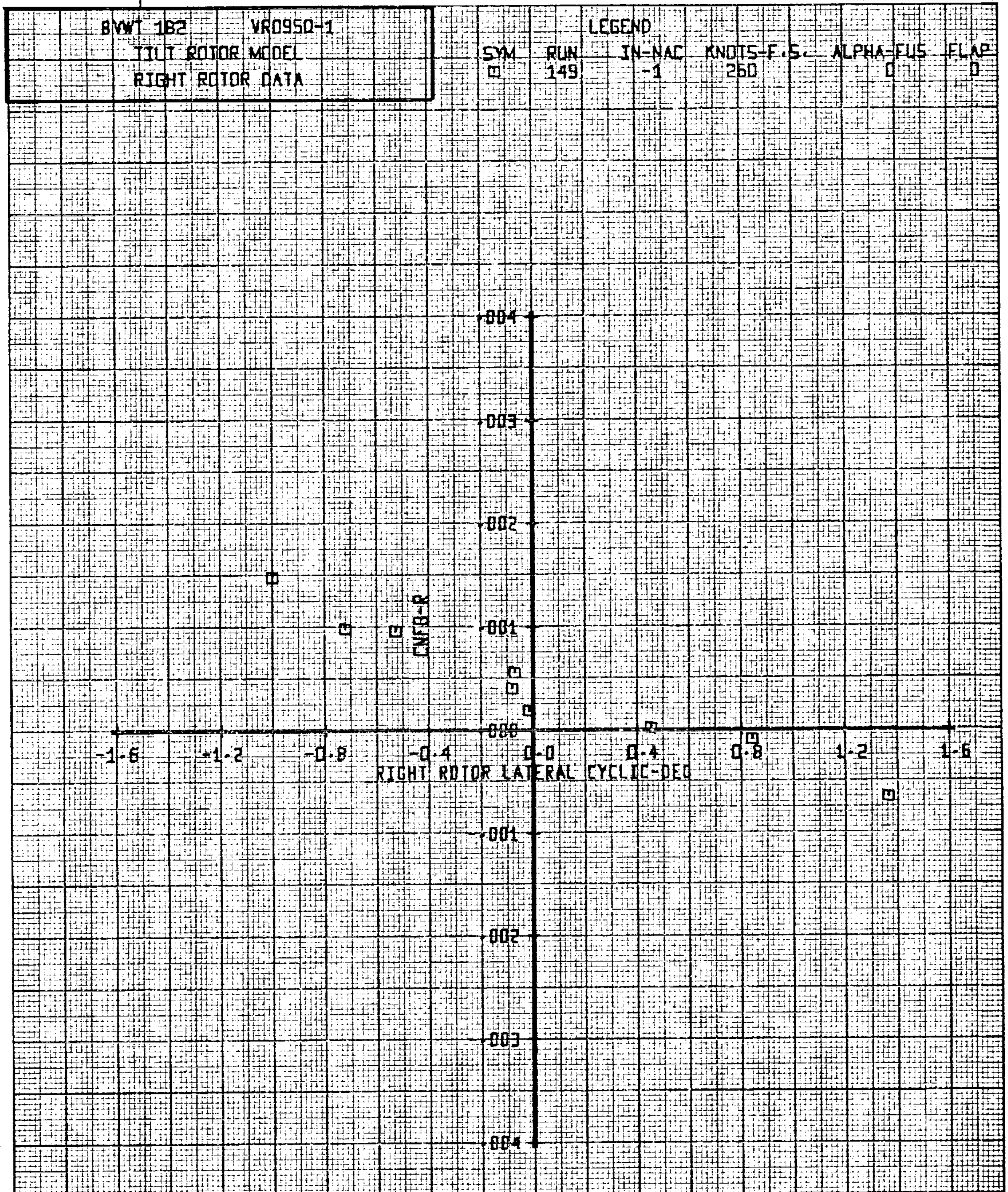


Figure 16-081. Right Rotor Normal Force Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

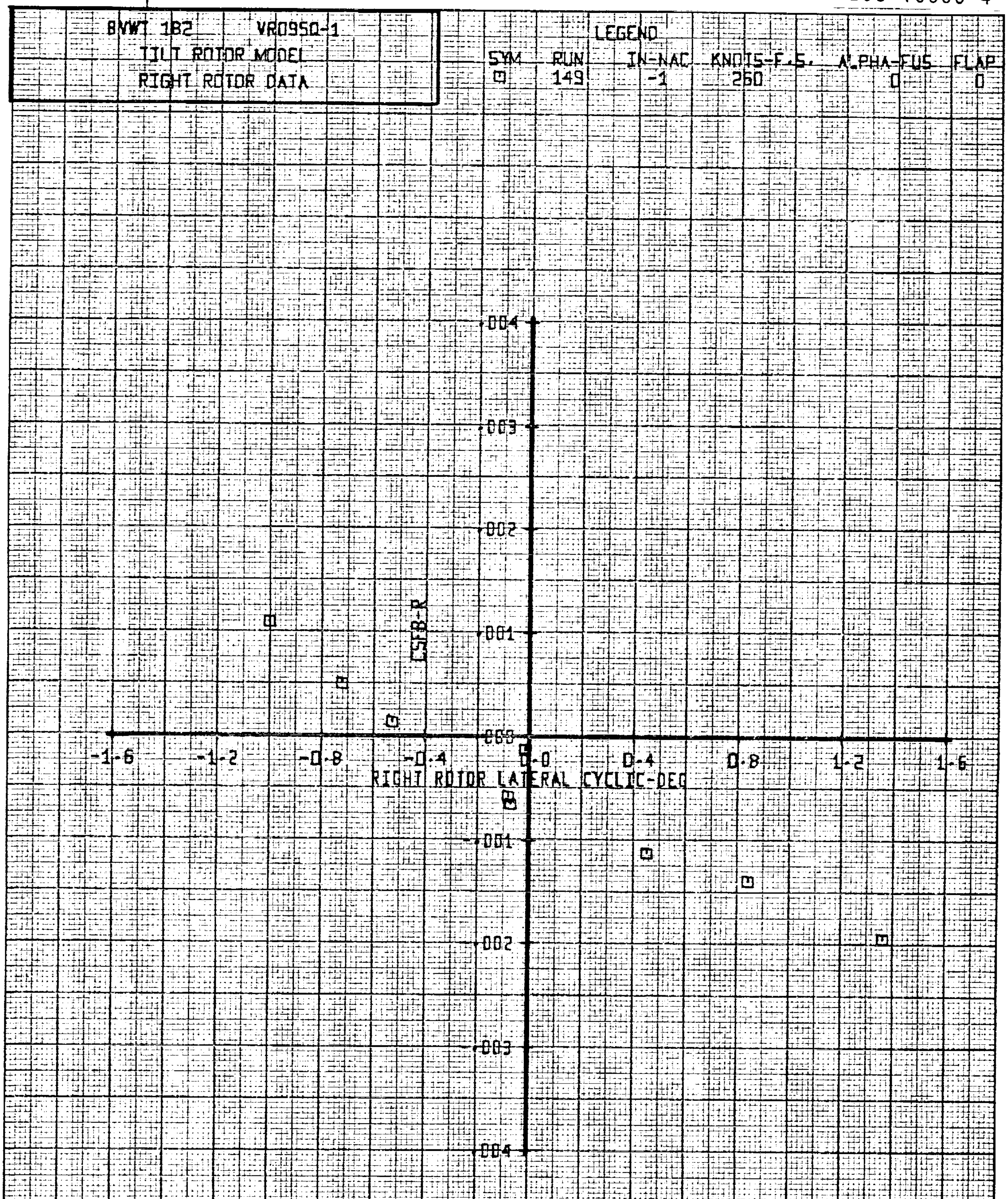


Figure 16-082. Right Rotor Side Force Coefficient Versus Right Rotor Lat. Cyclic ~ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

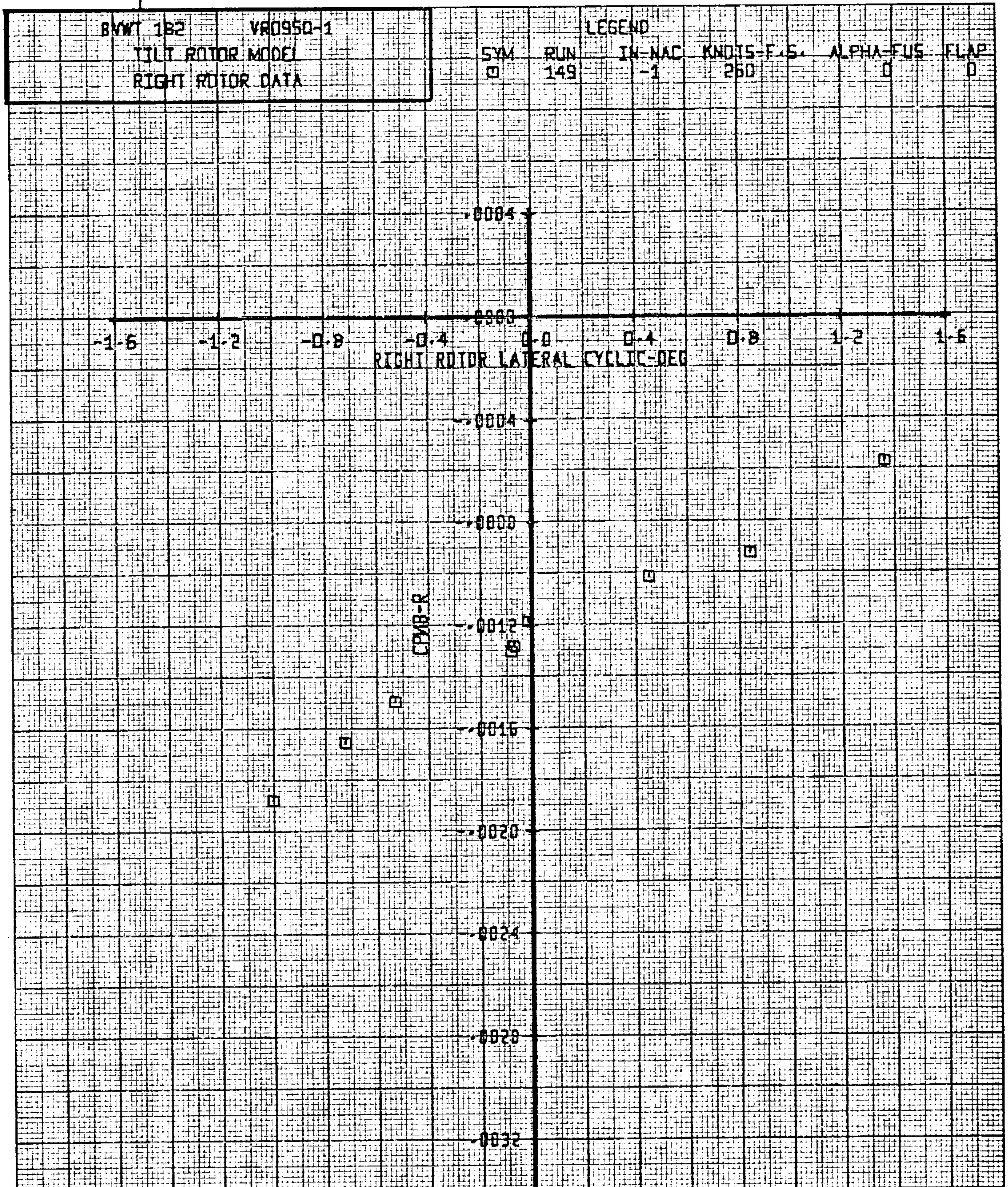


Figure 16-083. Right Rotor Pitching Moment Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

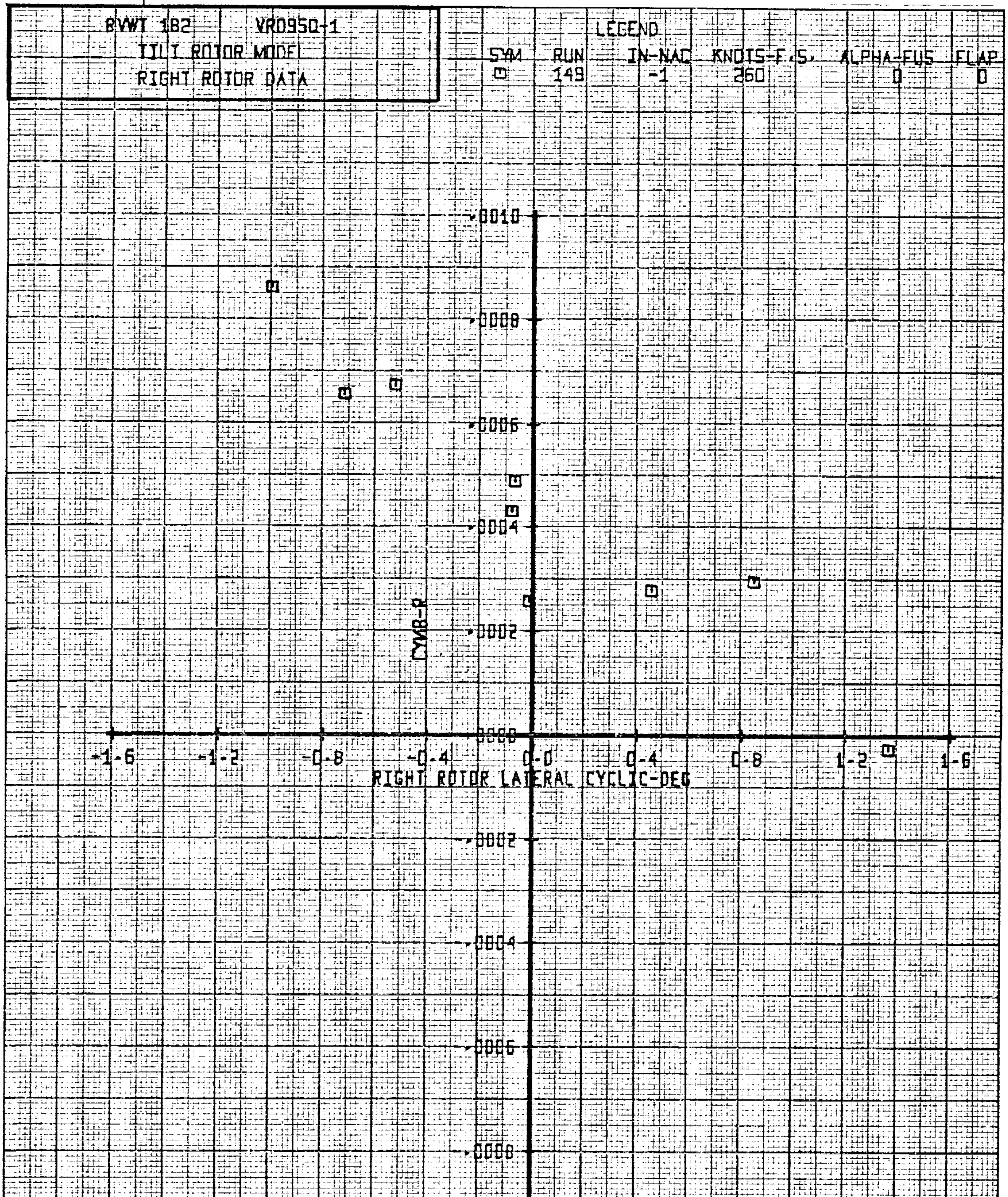


Figure 16-084. Right Rotor Yawing Moment Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

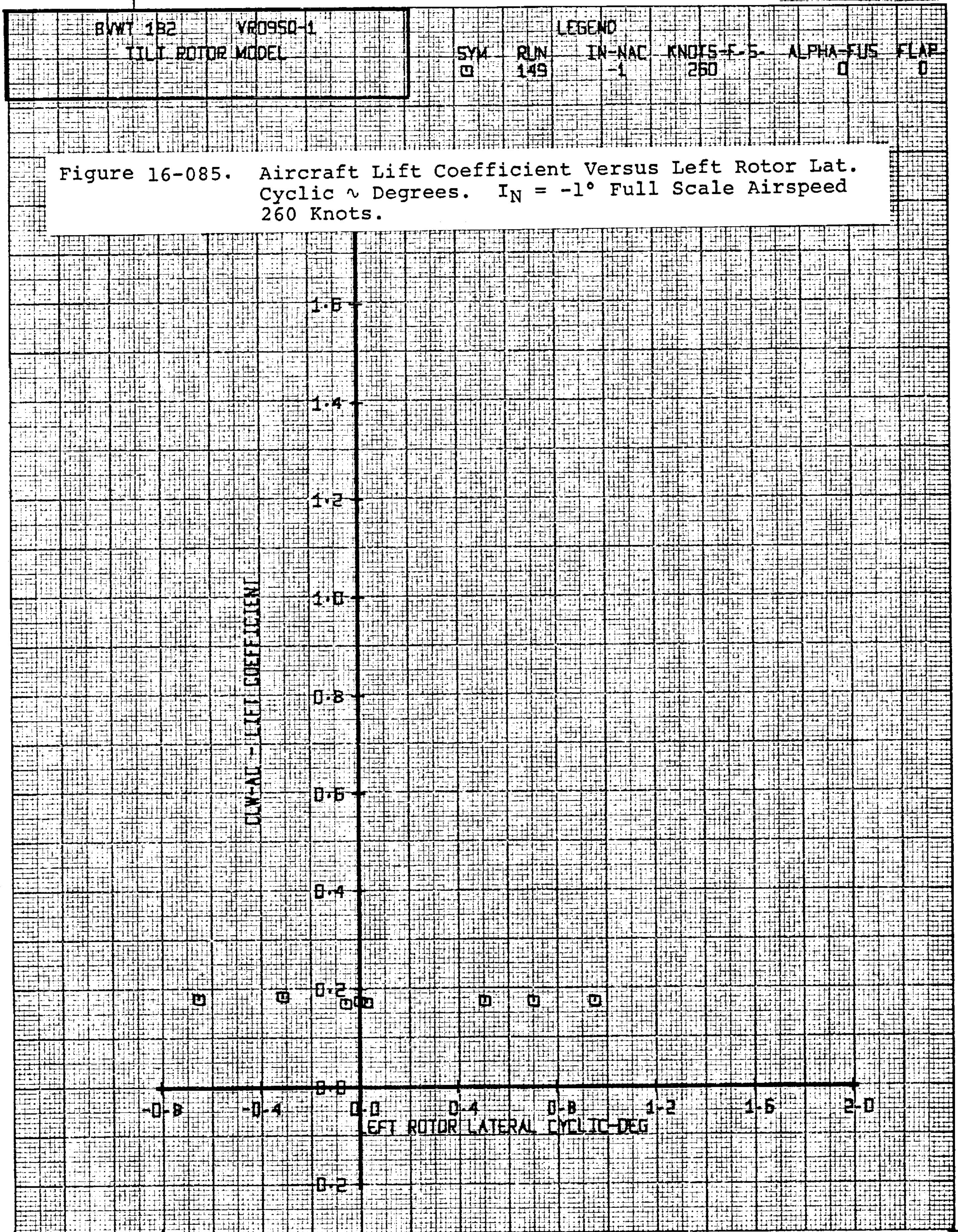


Figure 16-085. Aircraft Lift Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

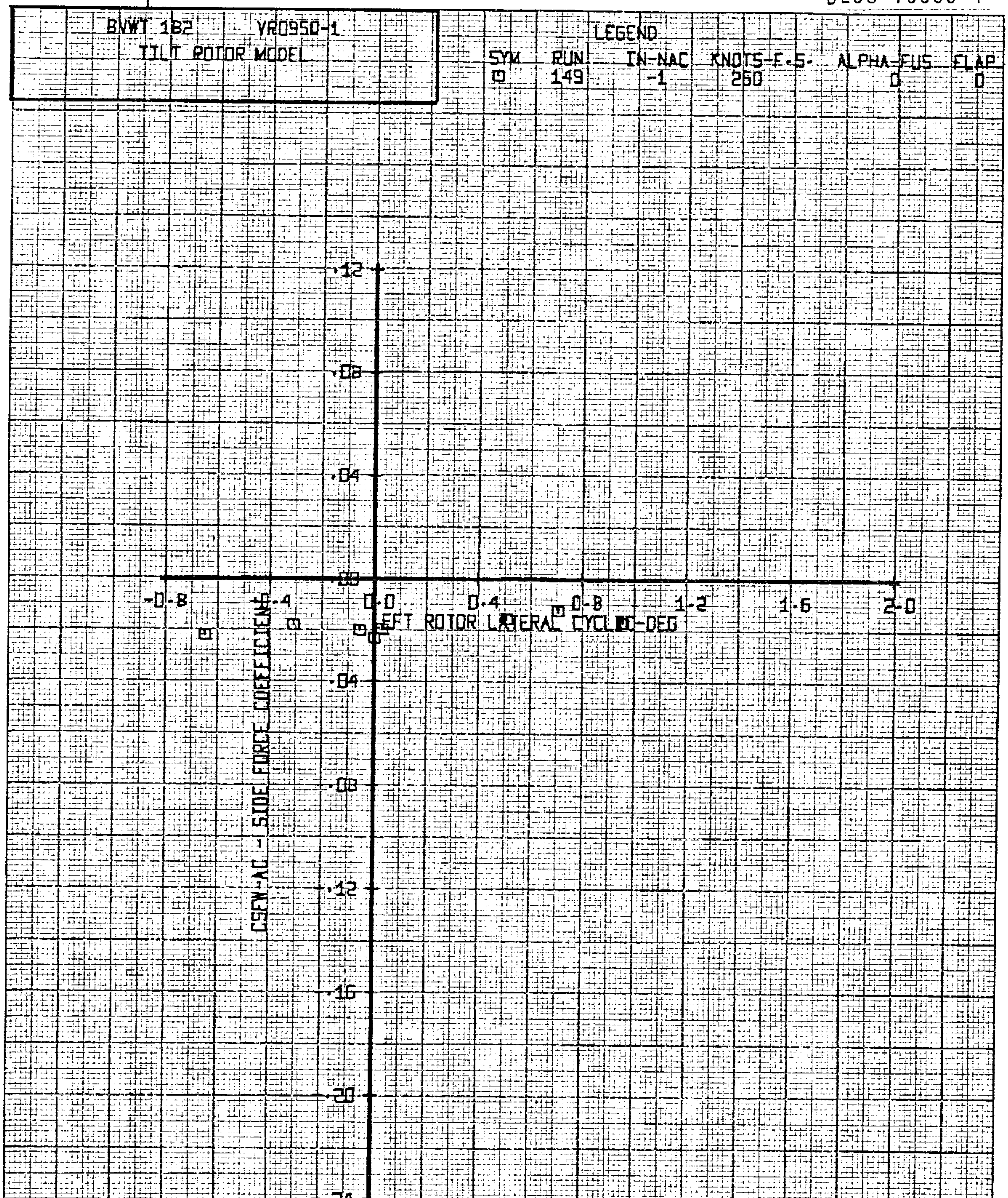


Figure 16-086. Aircraft Side Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

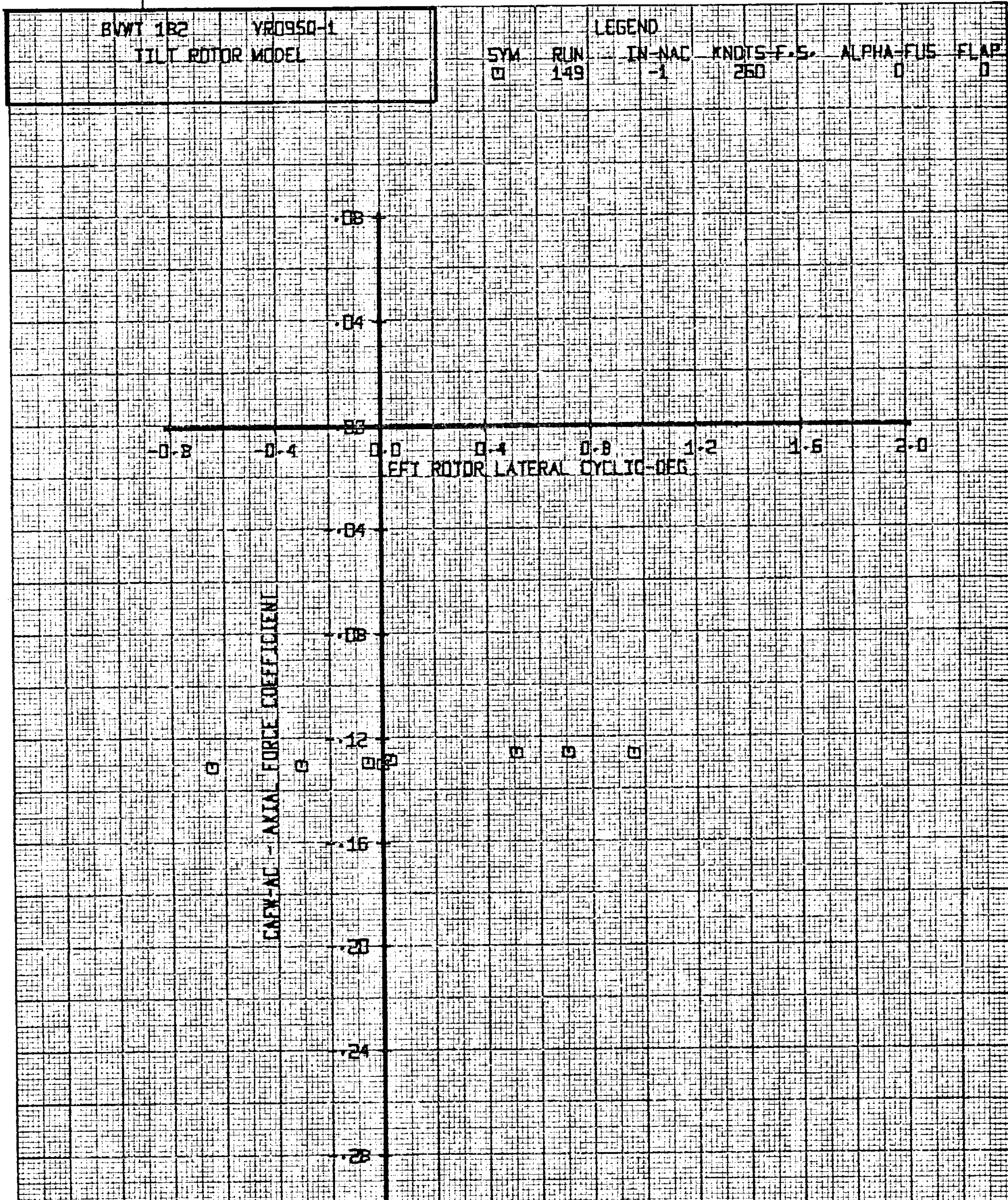


Figure 16-087. Aircraft Axial Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

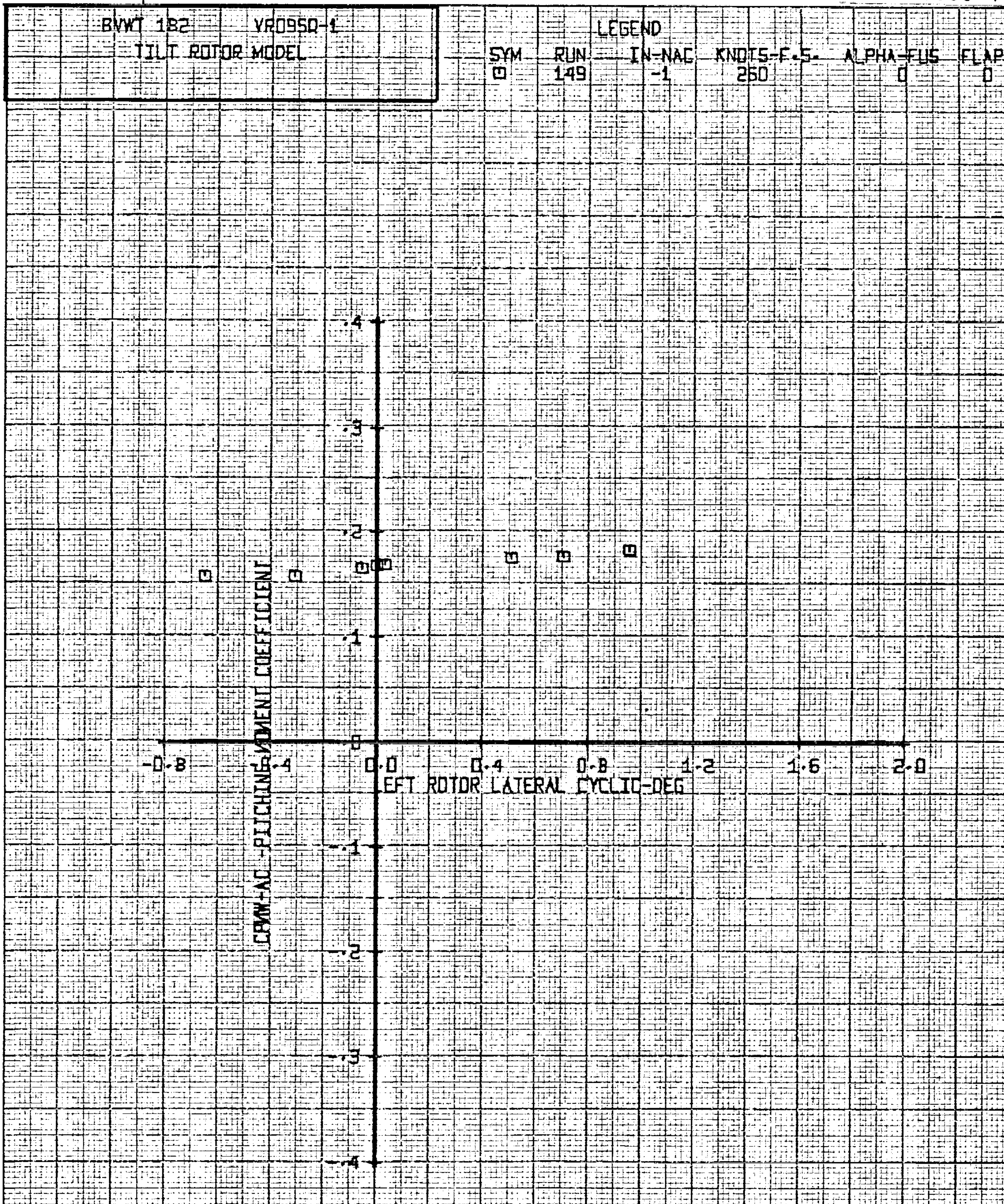


Figure 16-088. Aircraft Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

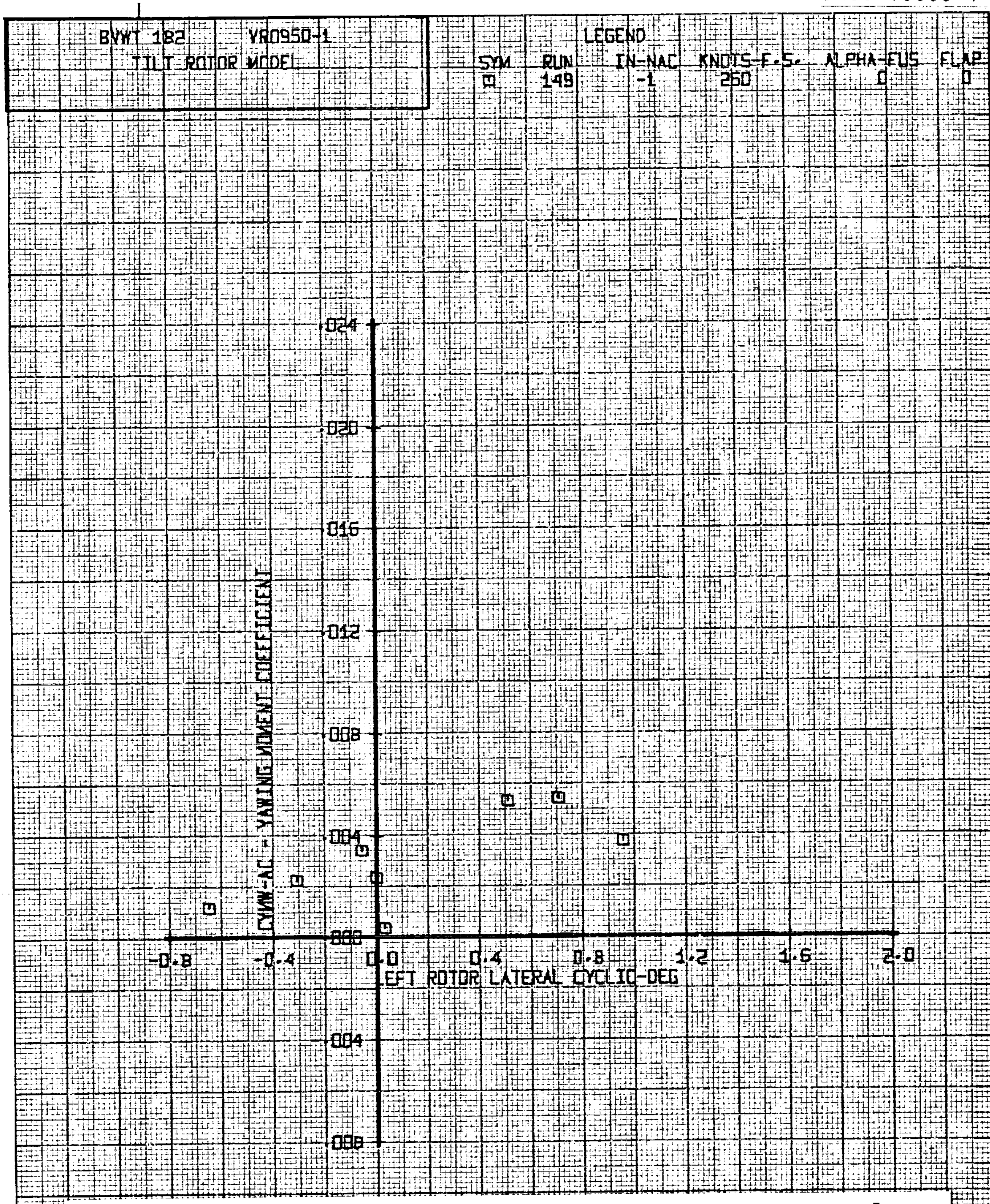


Figure 16-089. Aircraft Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

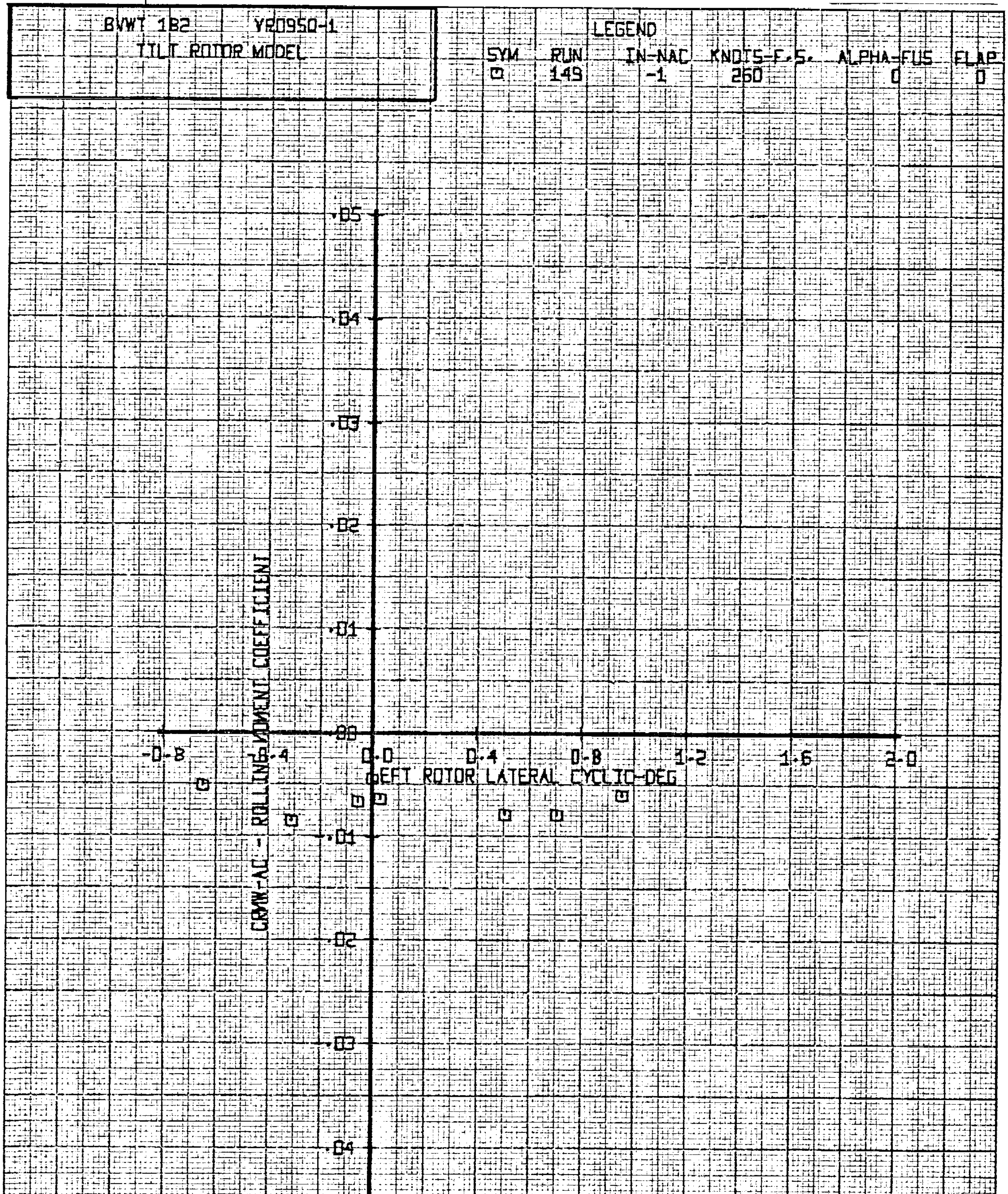


Figure 16-090. Aircraft Rolling Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

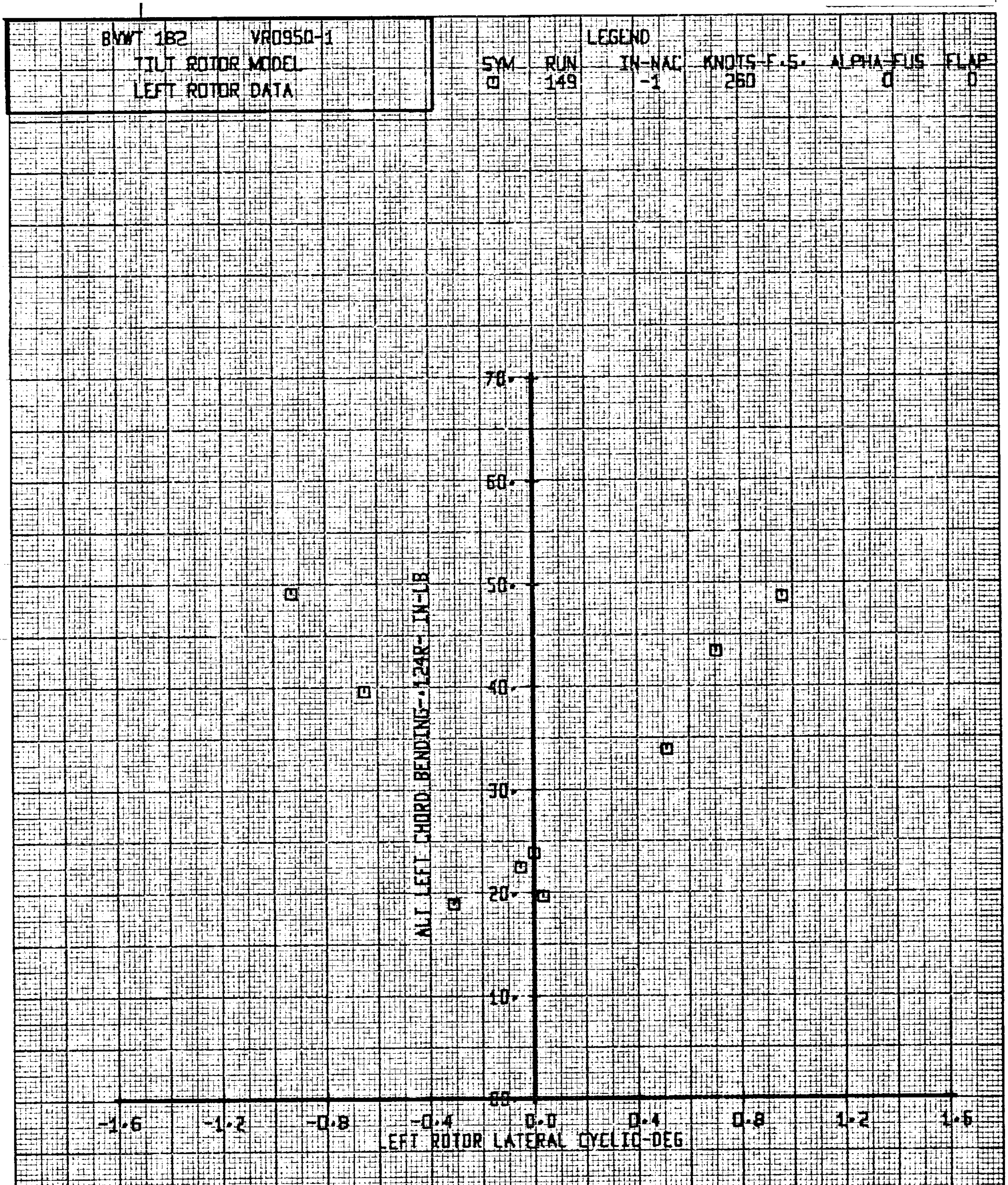


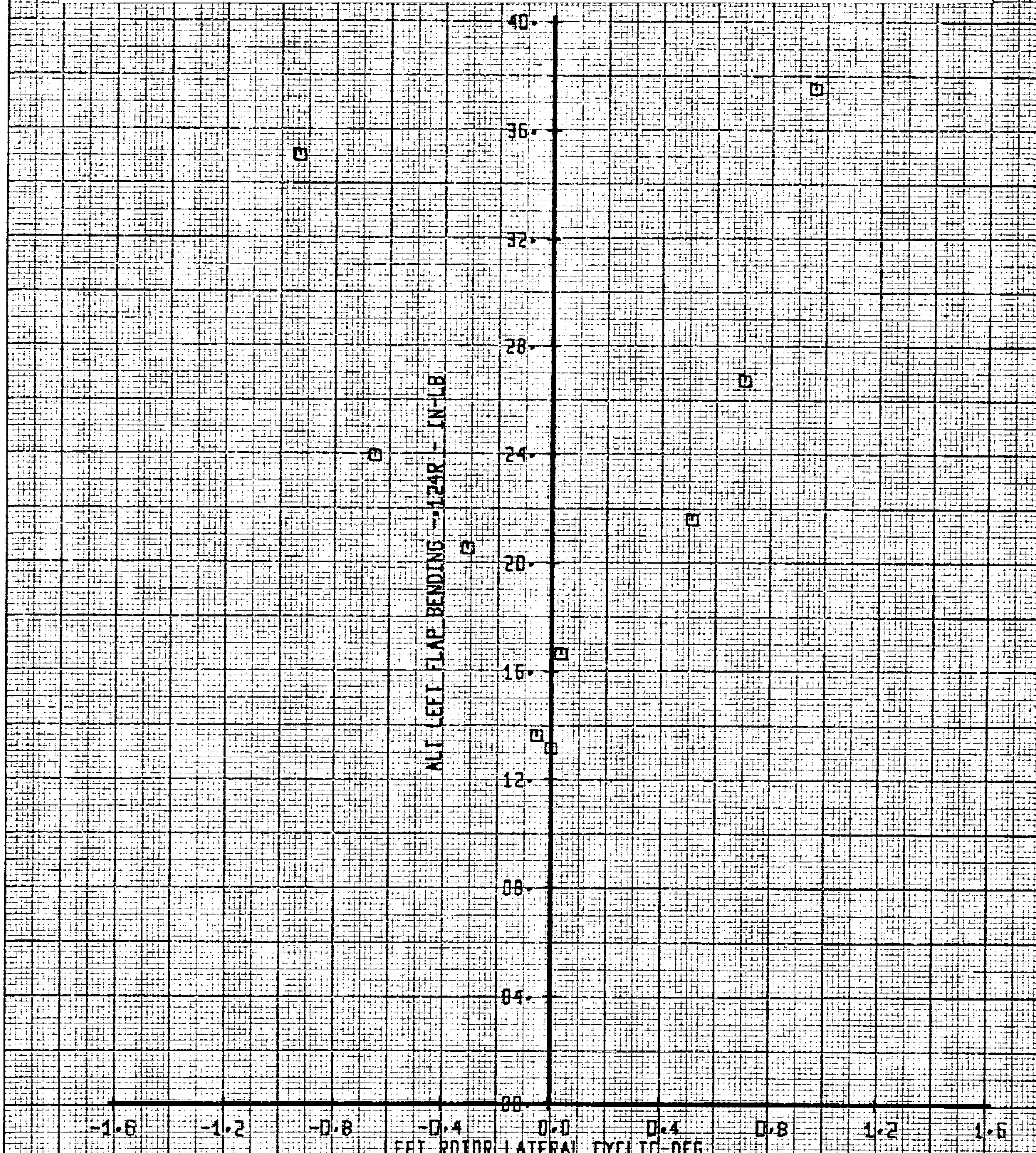
Figure 16-091. Alt. Left Chord Bending Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
LEFT ROTOR DATA

LEGEND

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	149	-1	260	0	0

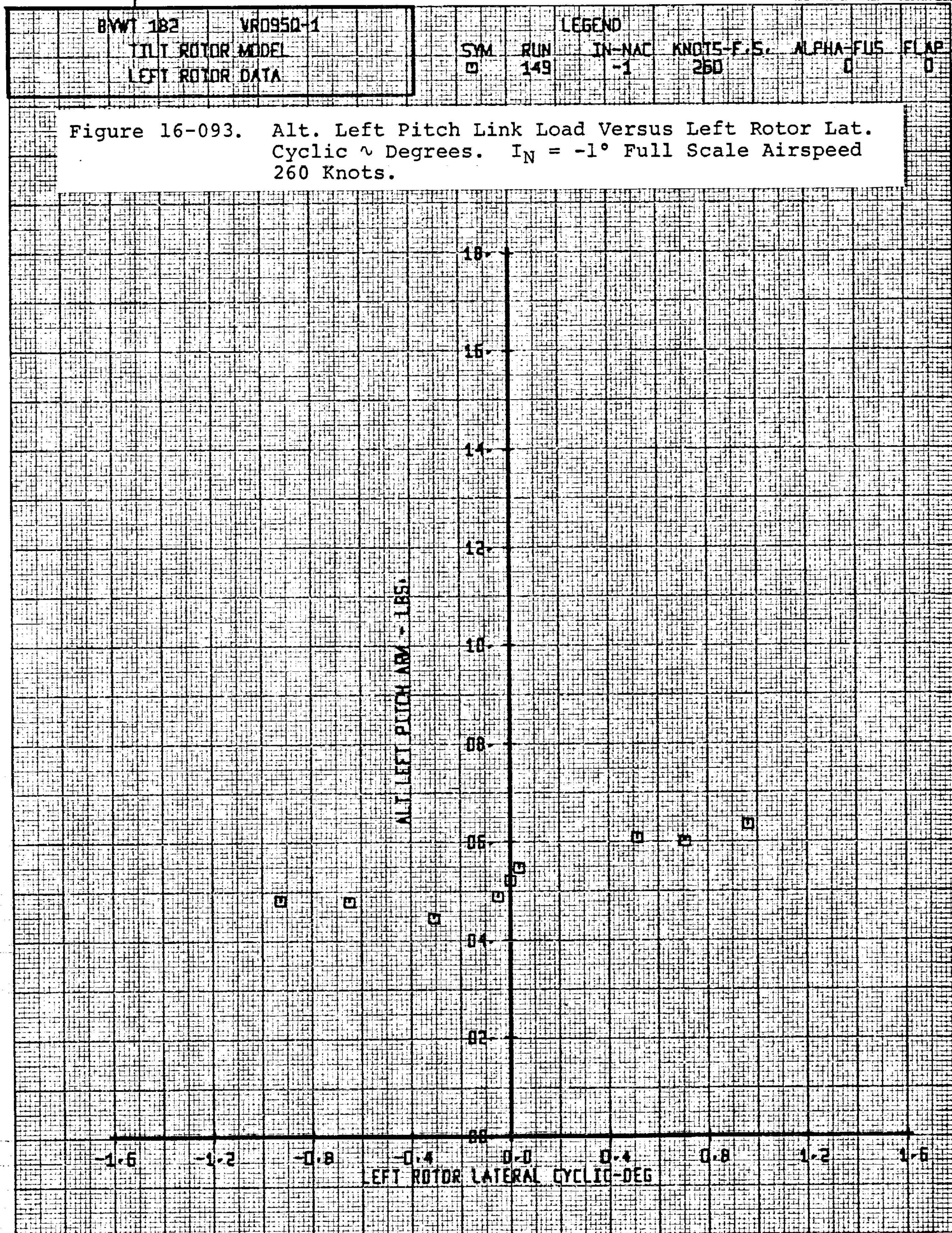
Figure 16-092. Alt. Left Flap Bending Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.



101
182

SET 101
BVWT 182

Figure 16-093. Alt. Left Pitch Link Load Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.



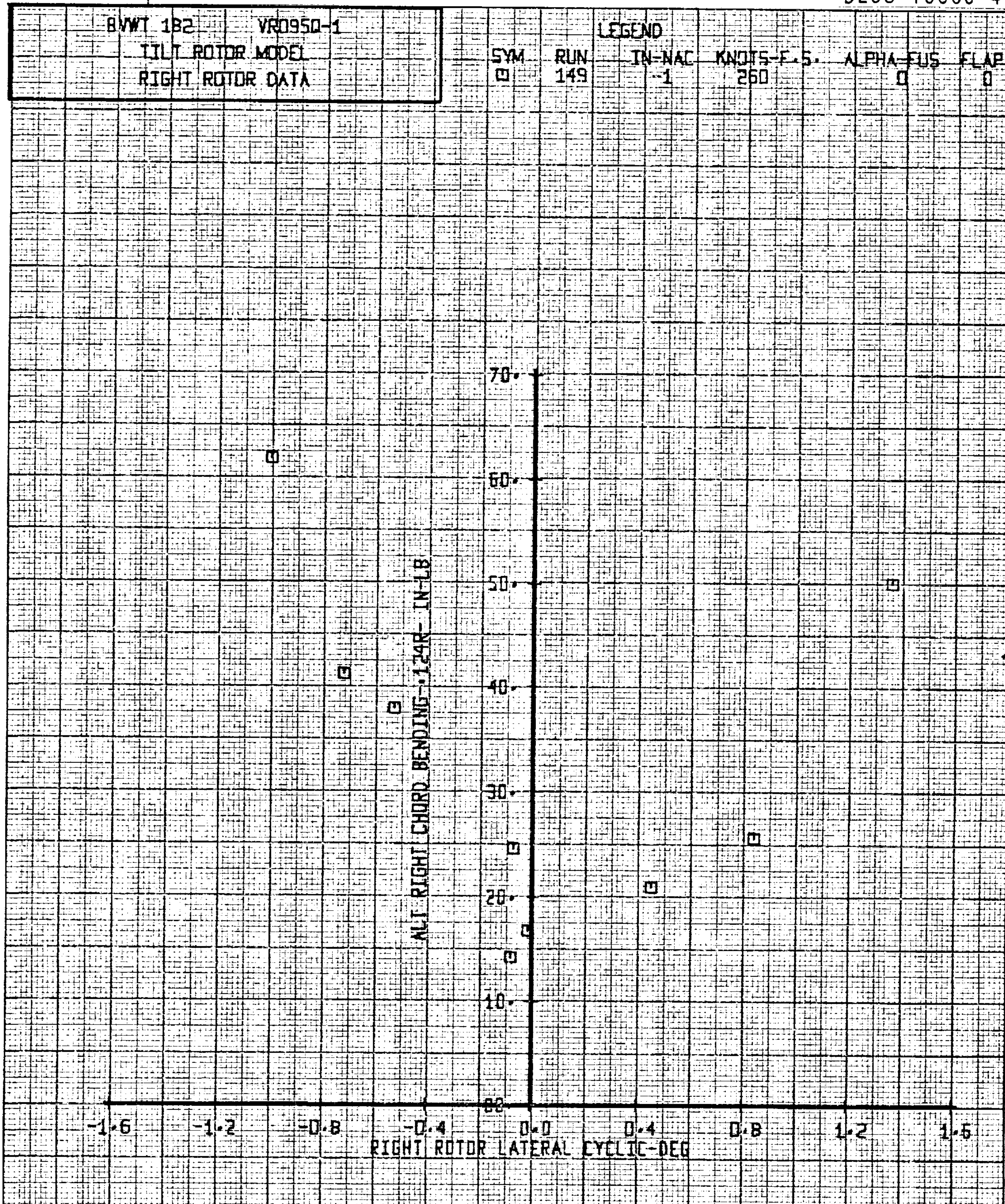


Figure 16-094. Alt. Right Chord Bending Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

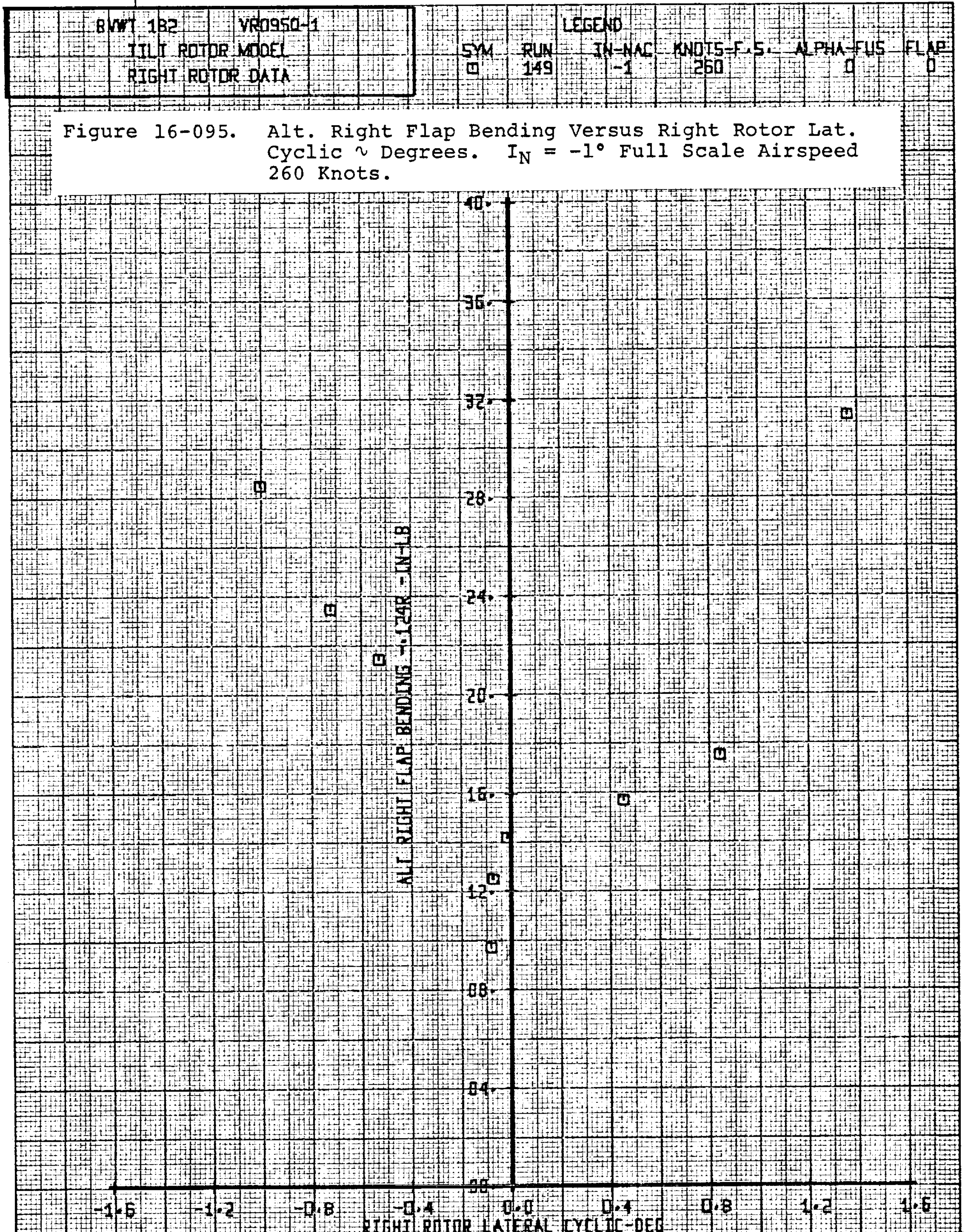


Figure 16-095. Alt. Right Flap Bending Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 260 Knots.

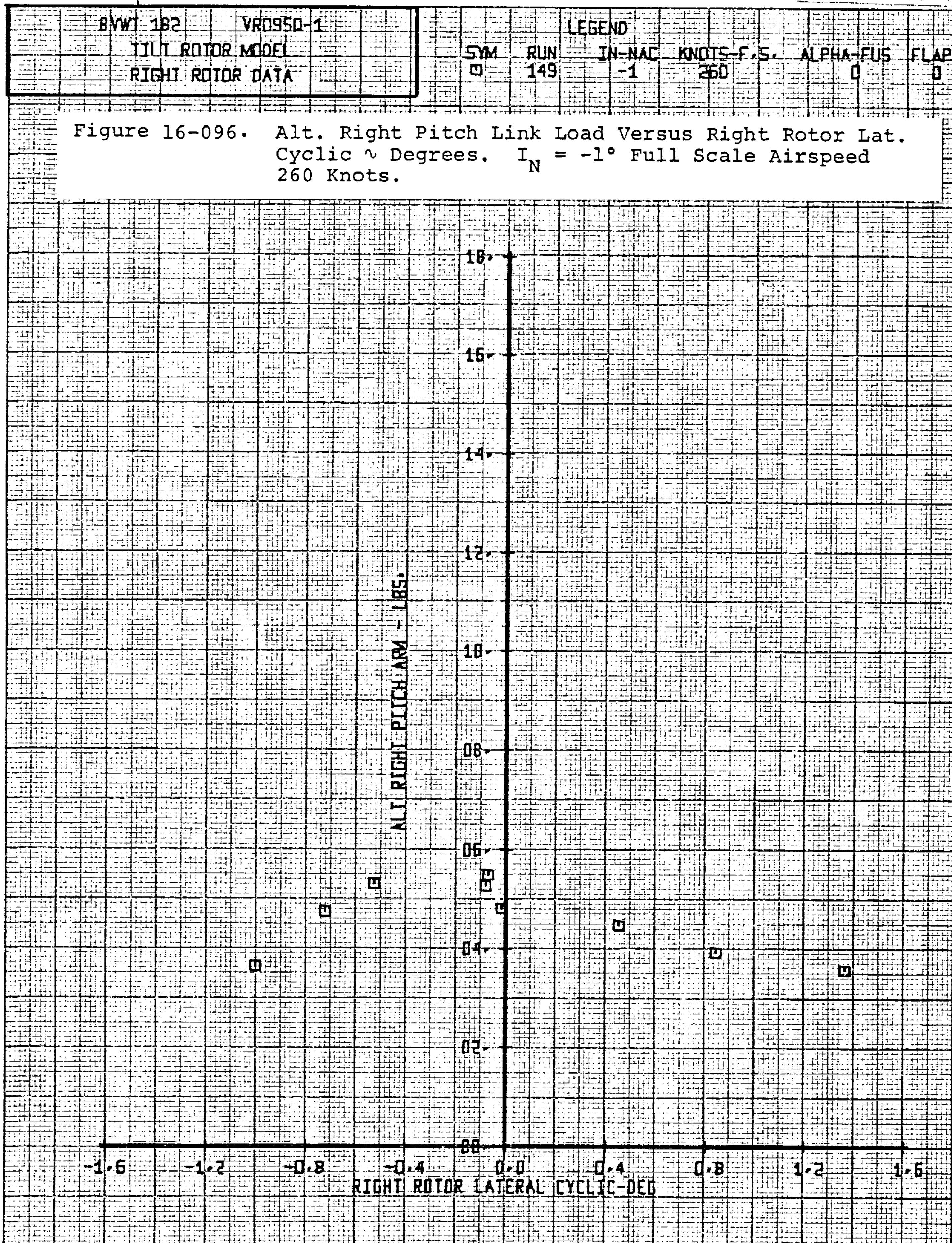


Figure 16-096. Alt. Right Pitch Link Load Versus Right Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 260 Knots.

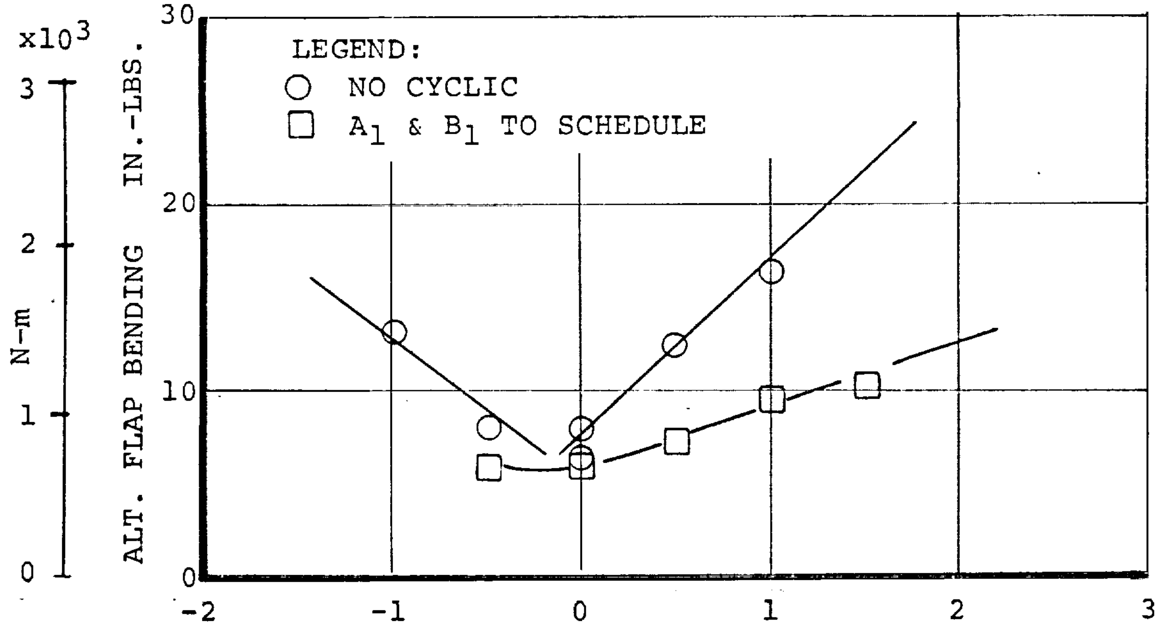


Figure 16-098. Alt. Left Rotor Blade Flap Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. $I_N = -1°$ Full Scale Airspeed 260 Knots.

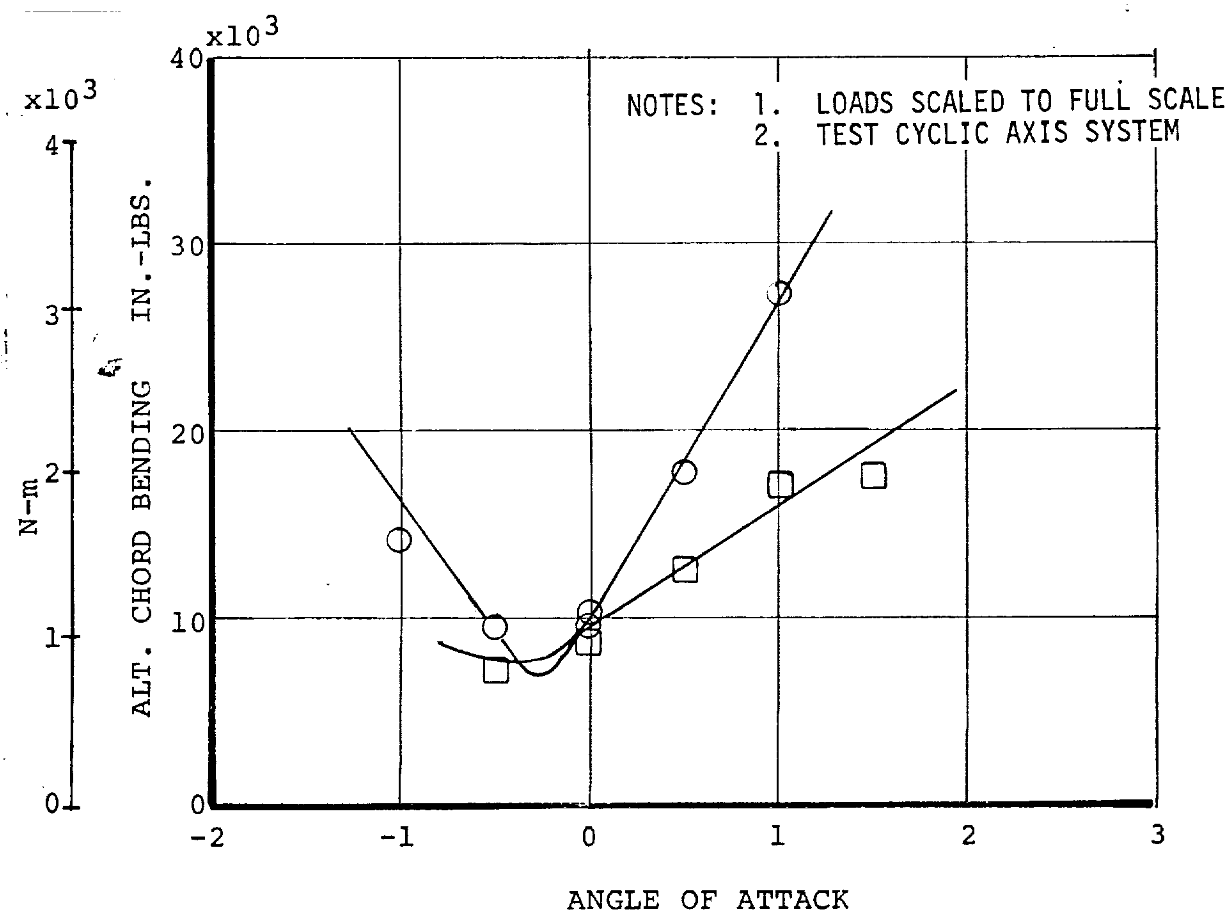
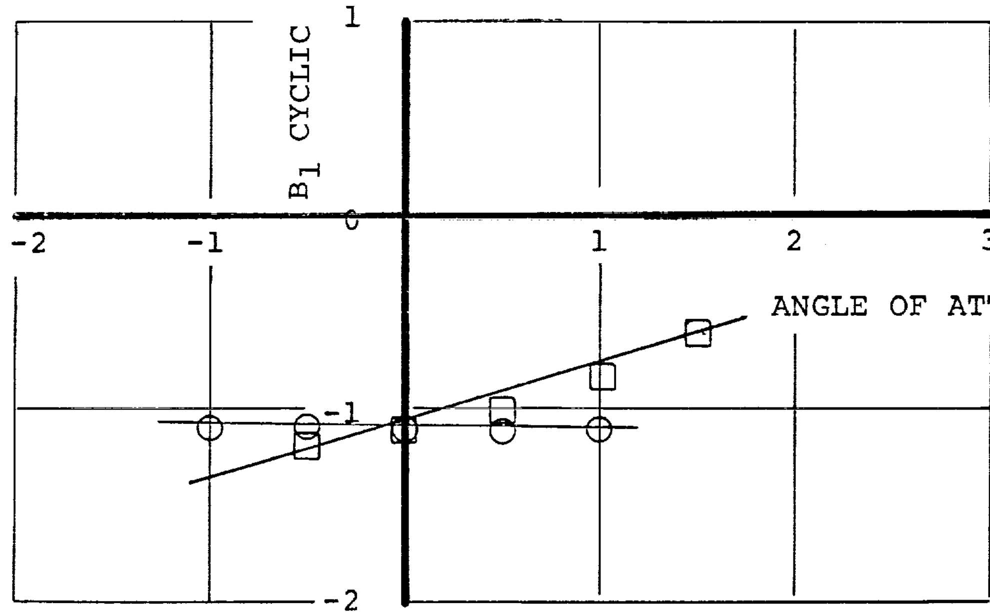


Figure 16-097. Alt. Left Rotor Blade Chord Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. $I_N = -1°$ Full Scale Airspeed 260 Knots.



LEGEND:
○ NO CYCLIC
□ A_1 & B_1 TO SCHEDULE

NOTES: 1. LOADS SCALED TO FULL SCALE
2. TEST CYCLIC AXIS SYSTEM

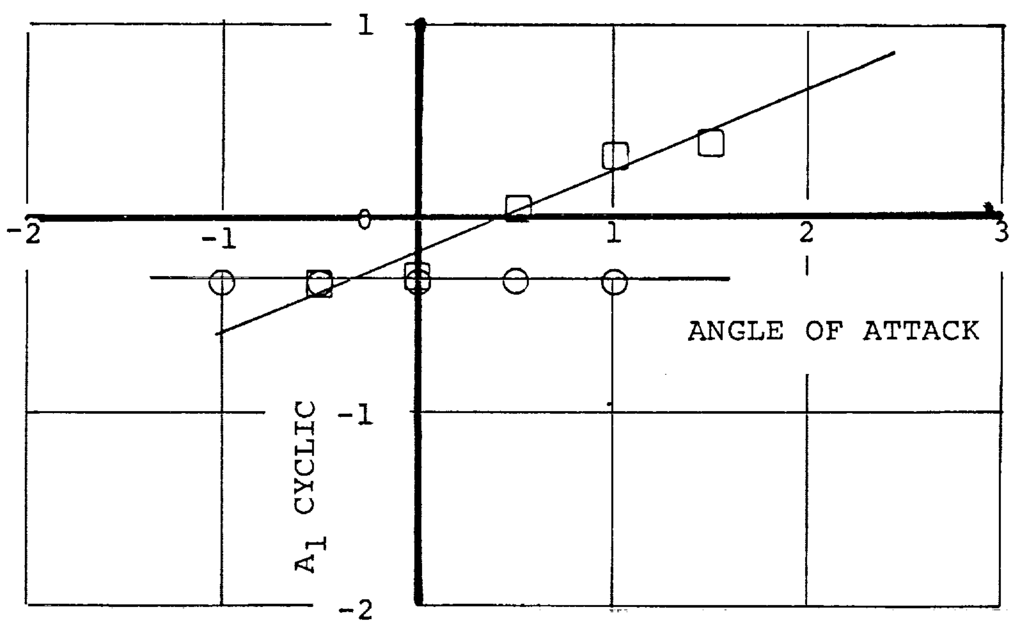


Figure 16-099. Left Rotor Cyclic Schedules. $I_N = -1°$ Full Scale Airspeed 260 Knots.

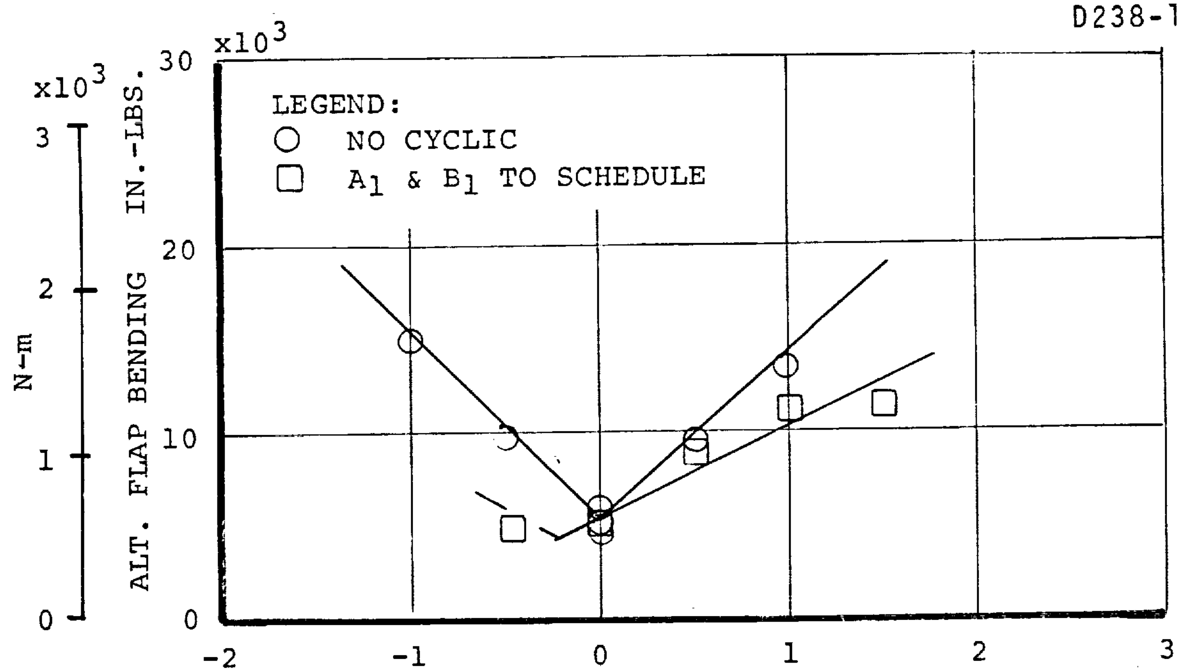


Figure 16-101. Alt. Right Rotor Blade Flap Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. I_N = -1° Full Scale Airspeed 260 Knots.

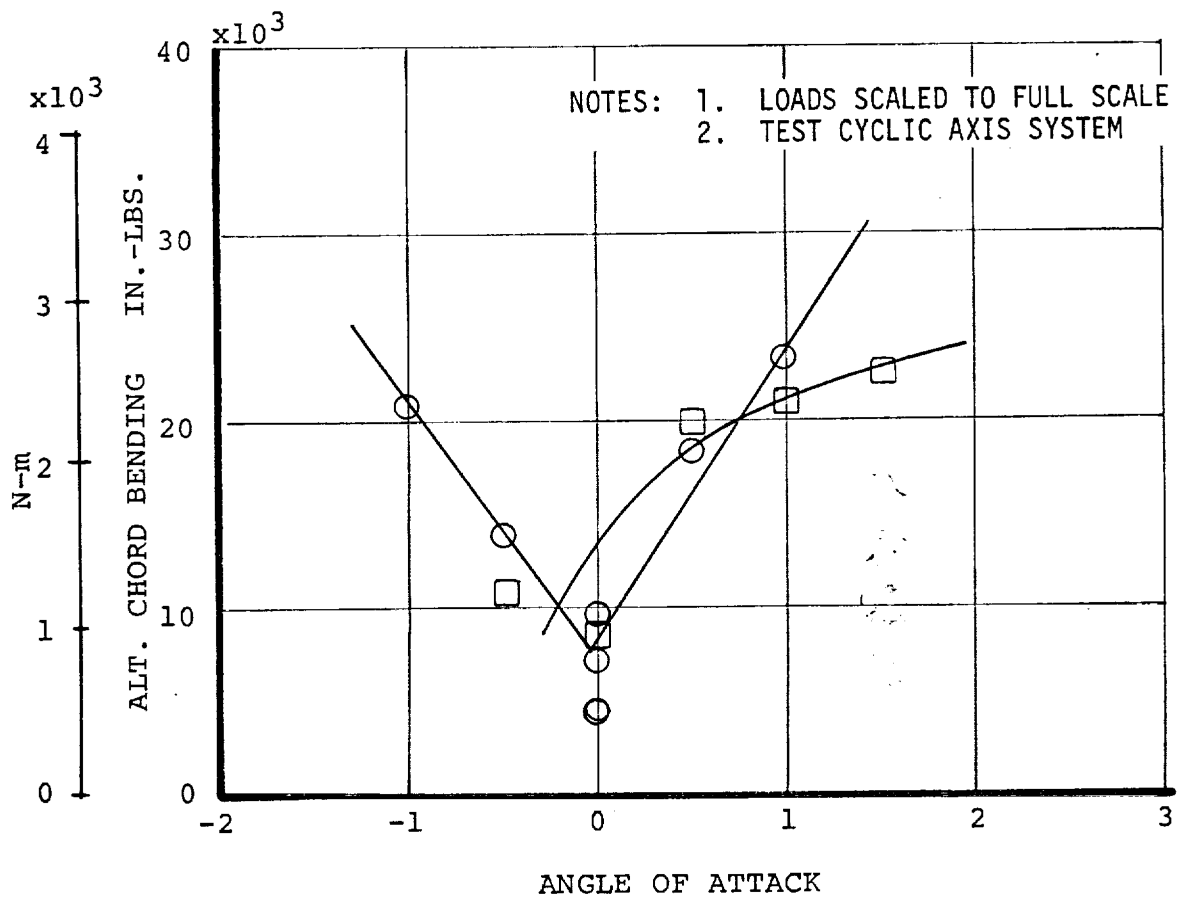
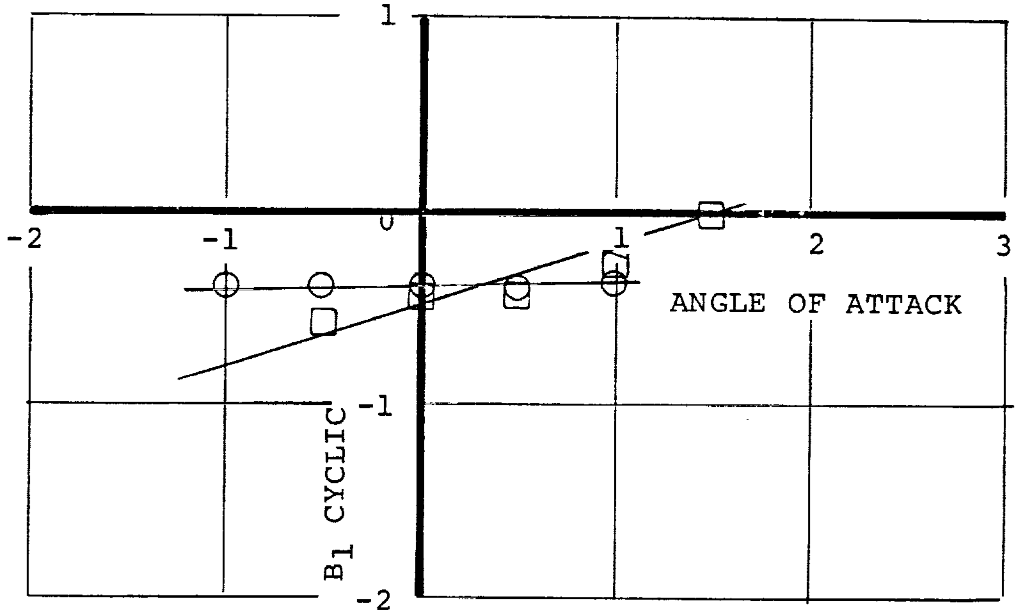


Figure 16-100. Alt. Right Rotor Blade Chord Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. I_N = -1° Full Scale Airspeed 260 Knots.



LEGEND:
○ NO CYCLIC
□ A_1 & B_1 TO SCHEDULE

NOTES: 1. LOADS SCALED TO FULL SCALE
2. TEST CYCLIC AXIS SYSTEM

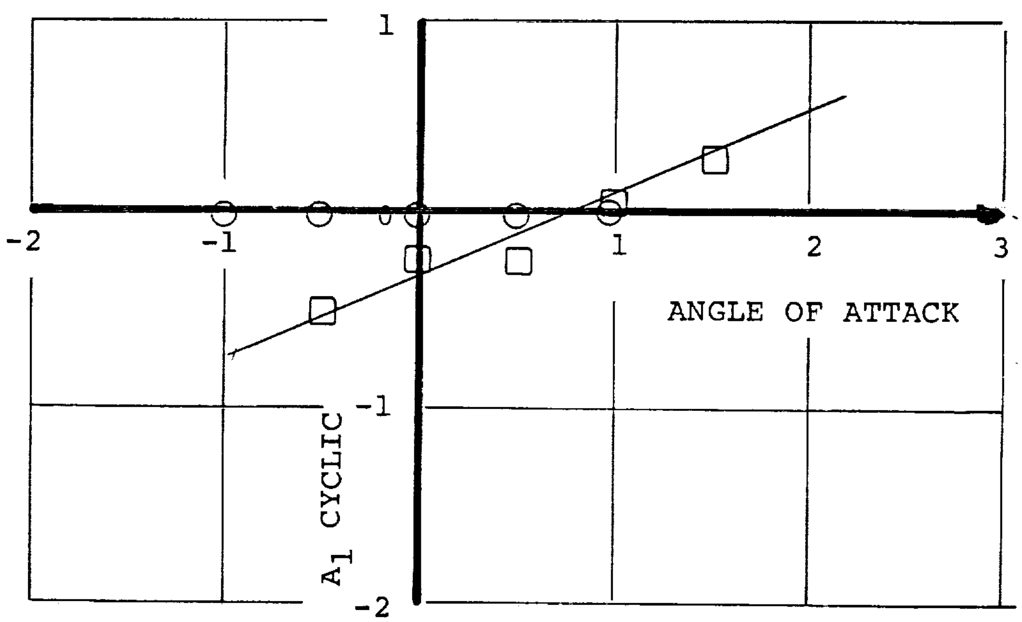
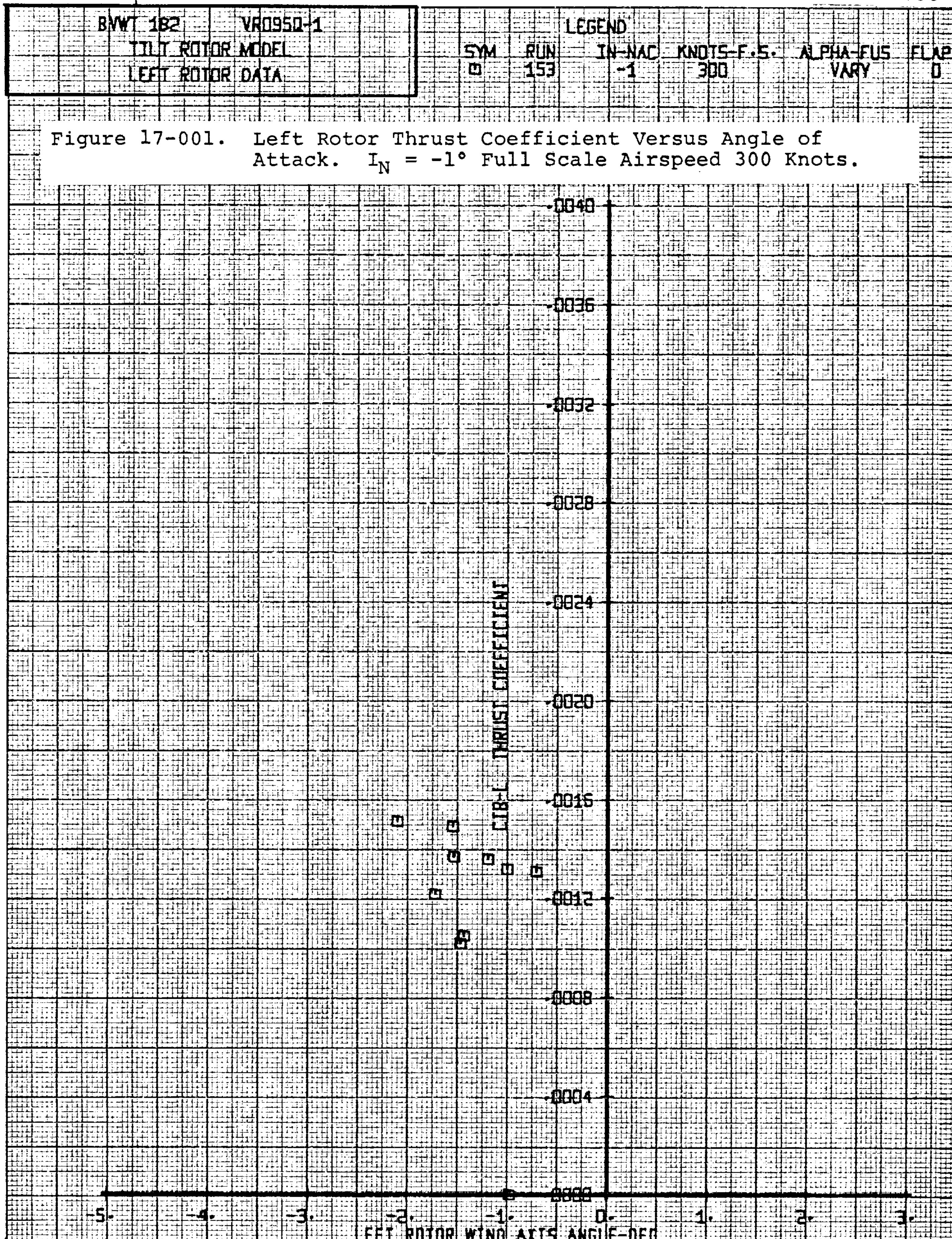


Figure 16-102. Right Rotor Cyclic Schedules. $I_N = -1°$ Full Scale Airspeed 260 Knots.

$I_N = -1^o$ $V_{FS} = 300$ KTS.

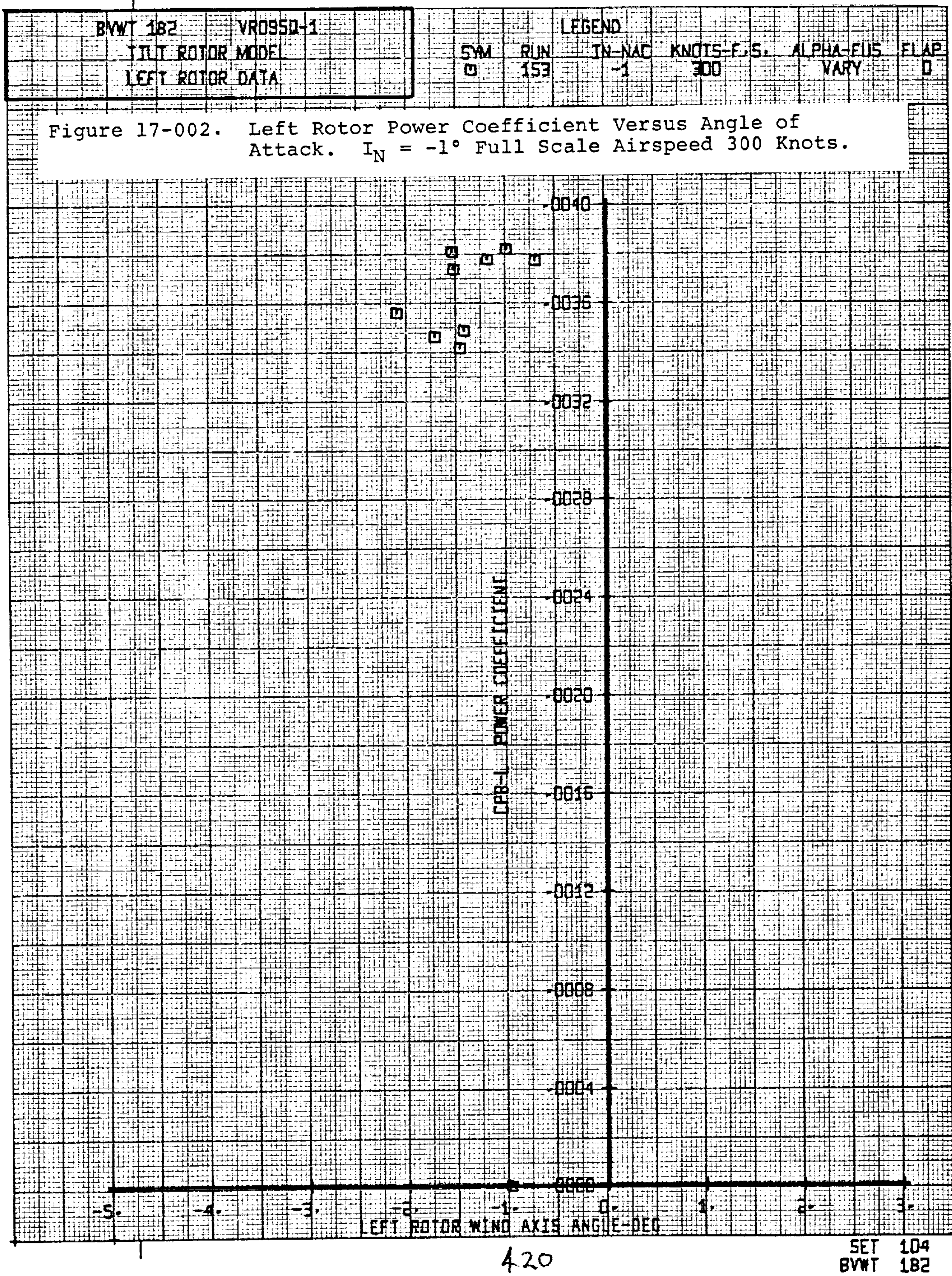
Figure 17-001. Left Rotor Thrust Coefficient Versus Angle of Attack. I_N = -1° Full Scale Airspeed 300 Knots.



104
182

SET 104
BVWT 182

Figure 17-002. Left Rotor Power Coefficient Versus Angle of Attack. I_N = -1° Full Scale Airspeed 300 Knots.



104
182

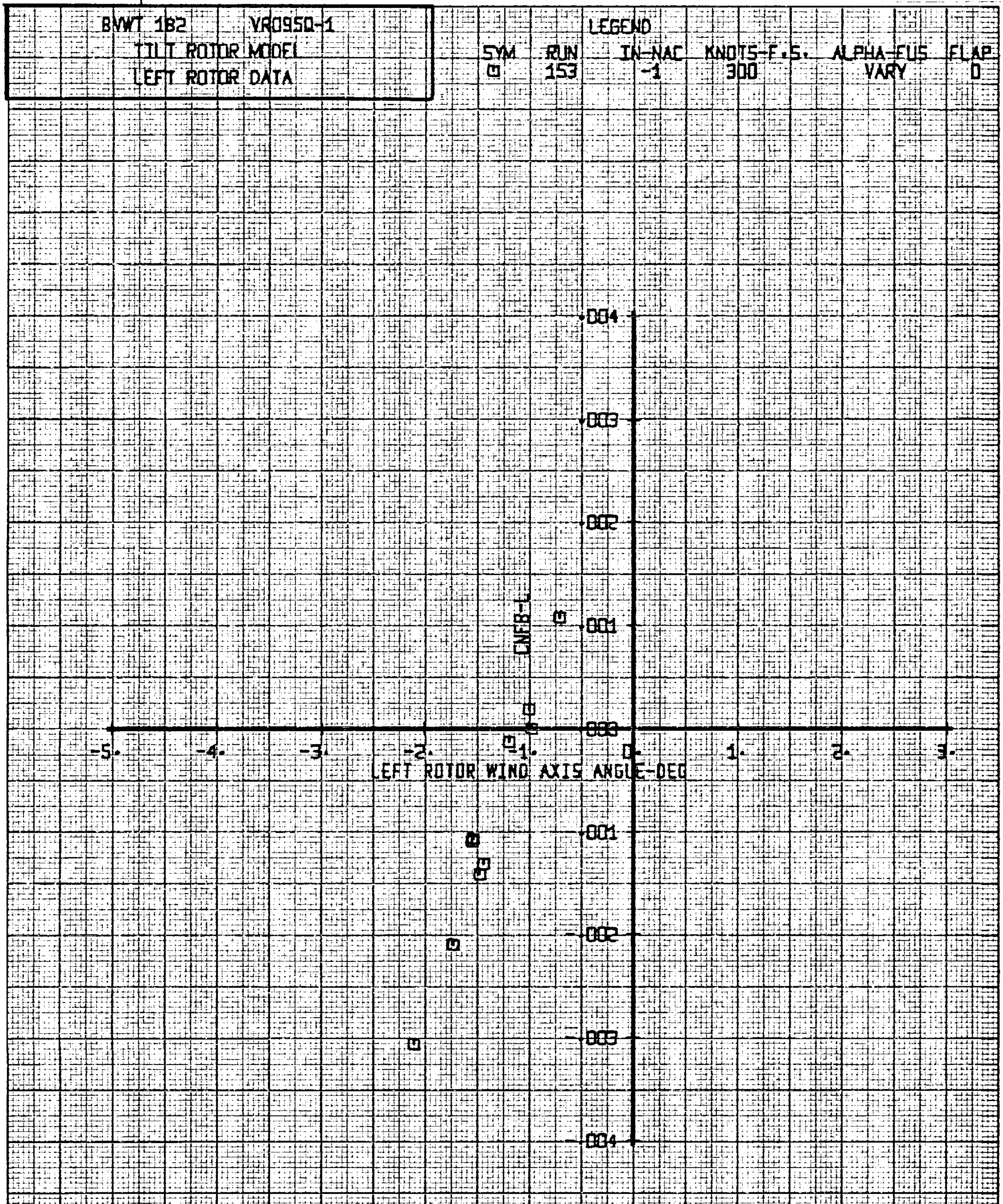


Figure 17-003. Left Rotor Normal Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 300 Knots.

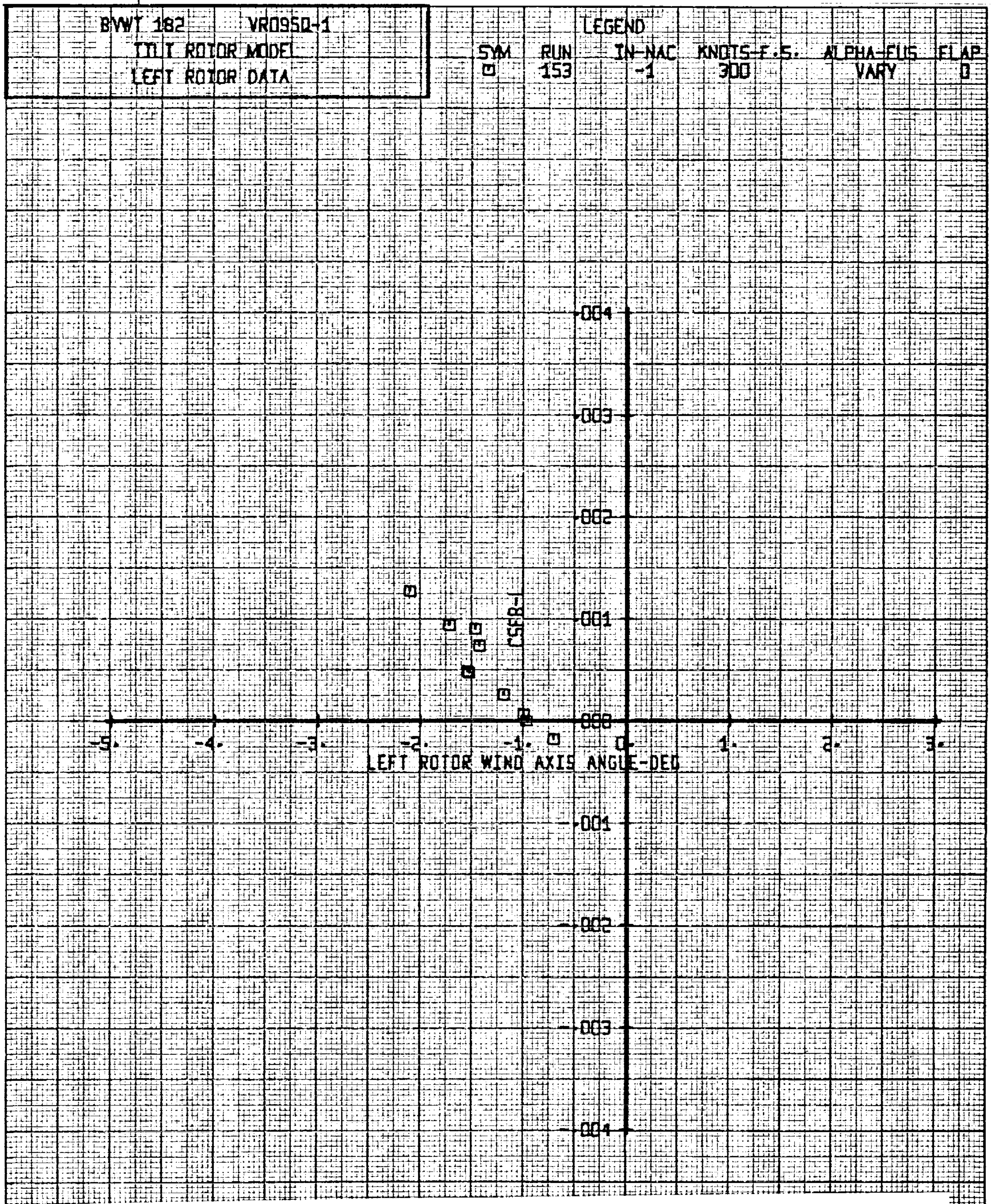


Figure 17-004. Left Rotor Side Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 300 Knots.

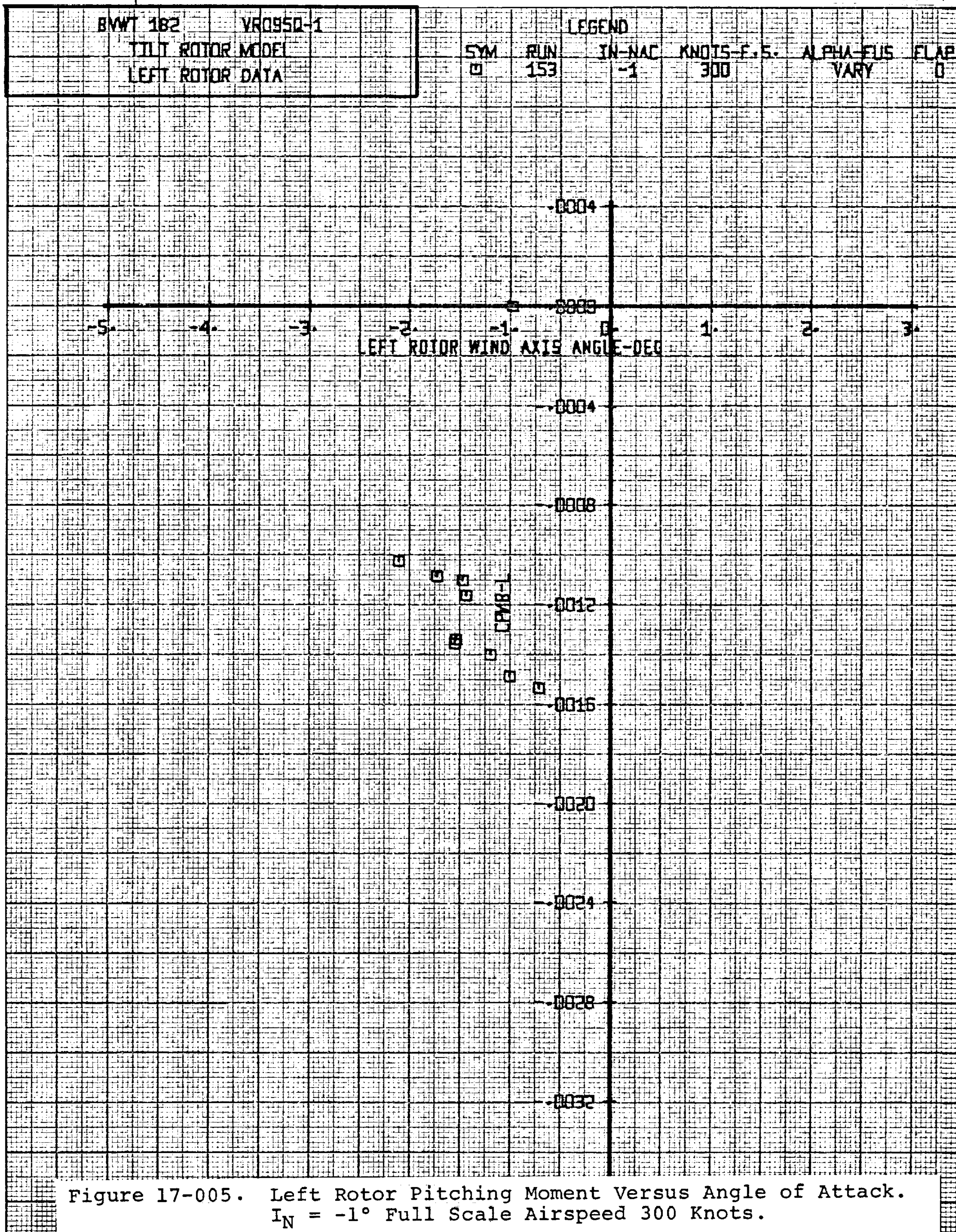


Figure 17-005. Left Rotor Pitching Moment Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 300 Knots.

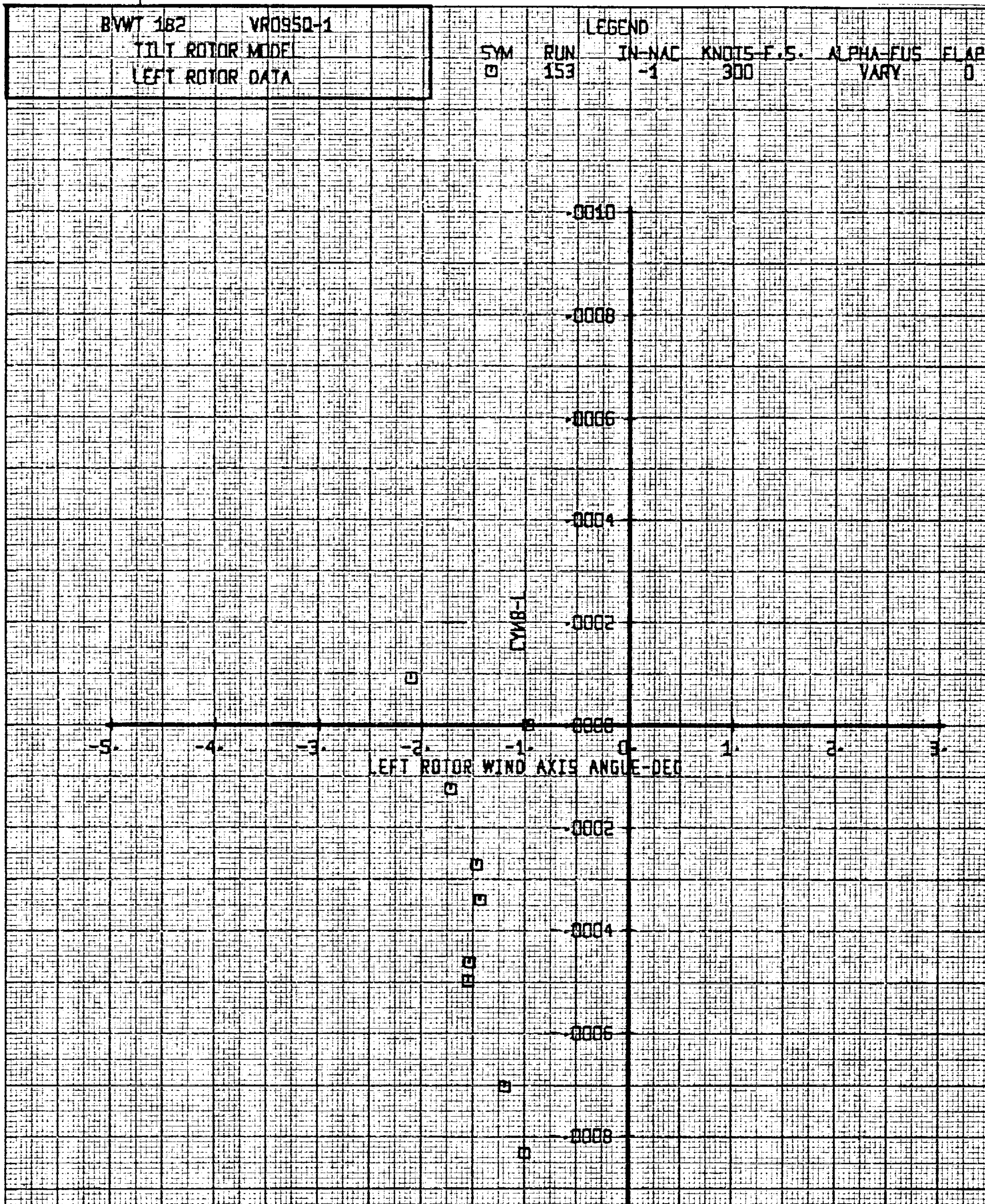
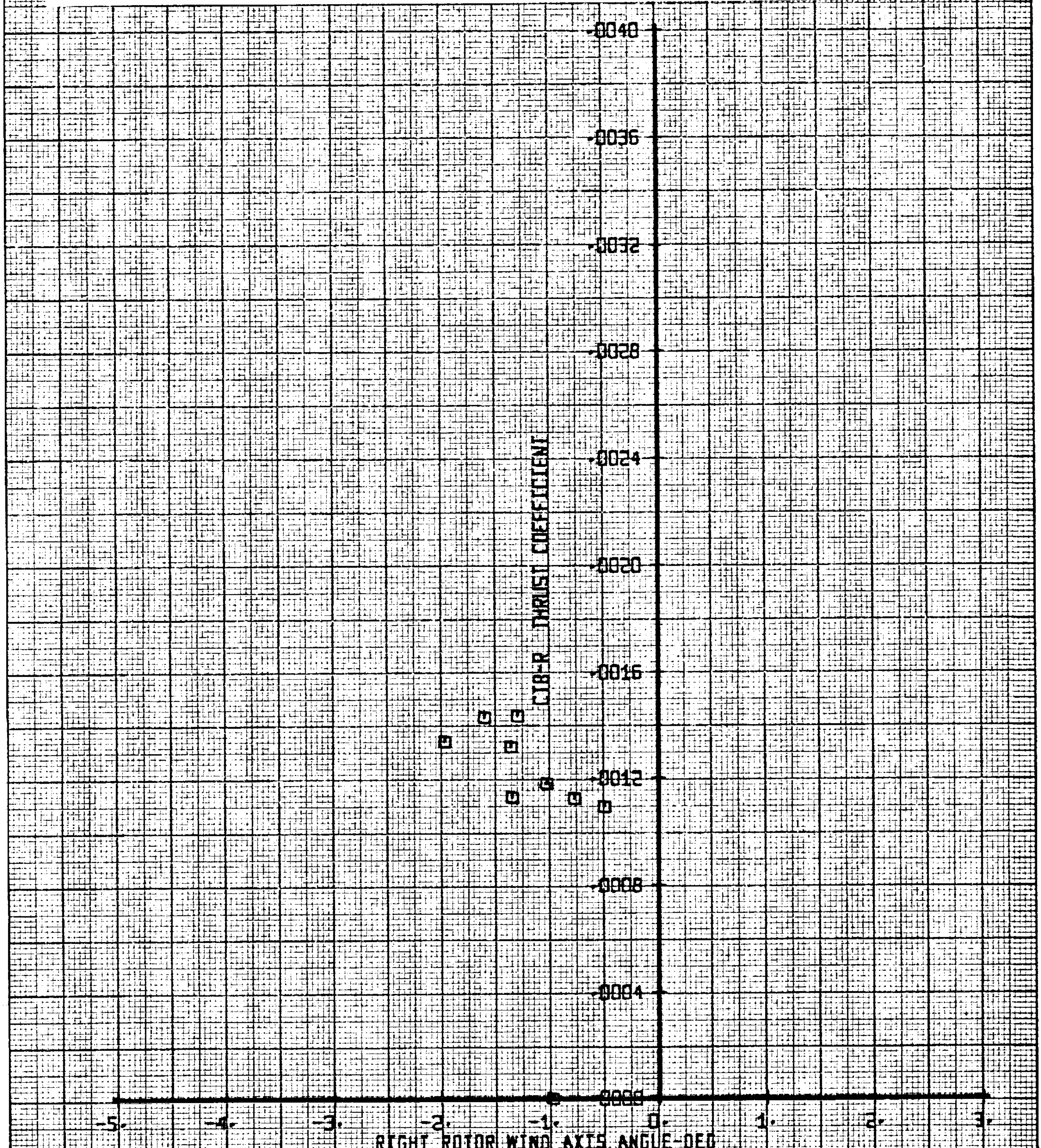


Figure 17-006. Left Rotor Yawing Moment Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 300 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	153	-1	300	VARY	0

Figure 17-007. Right Rotor Thrust Coefficient Versus Angle of Attack. I_N = -1° Full Scale Airspeed 300 Knots.



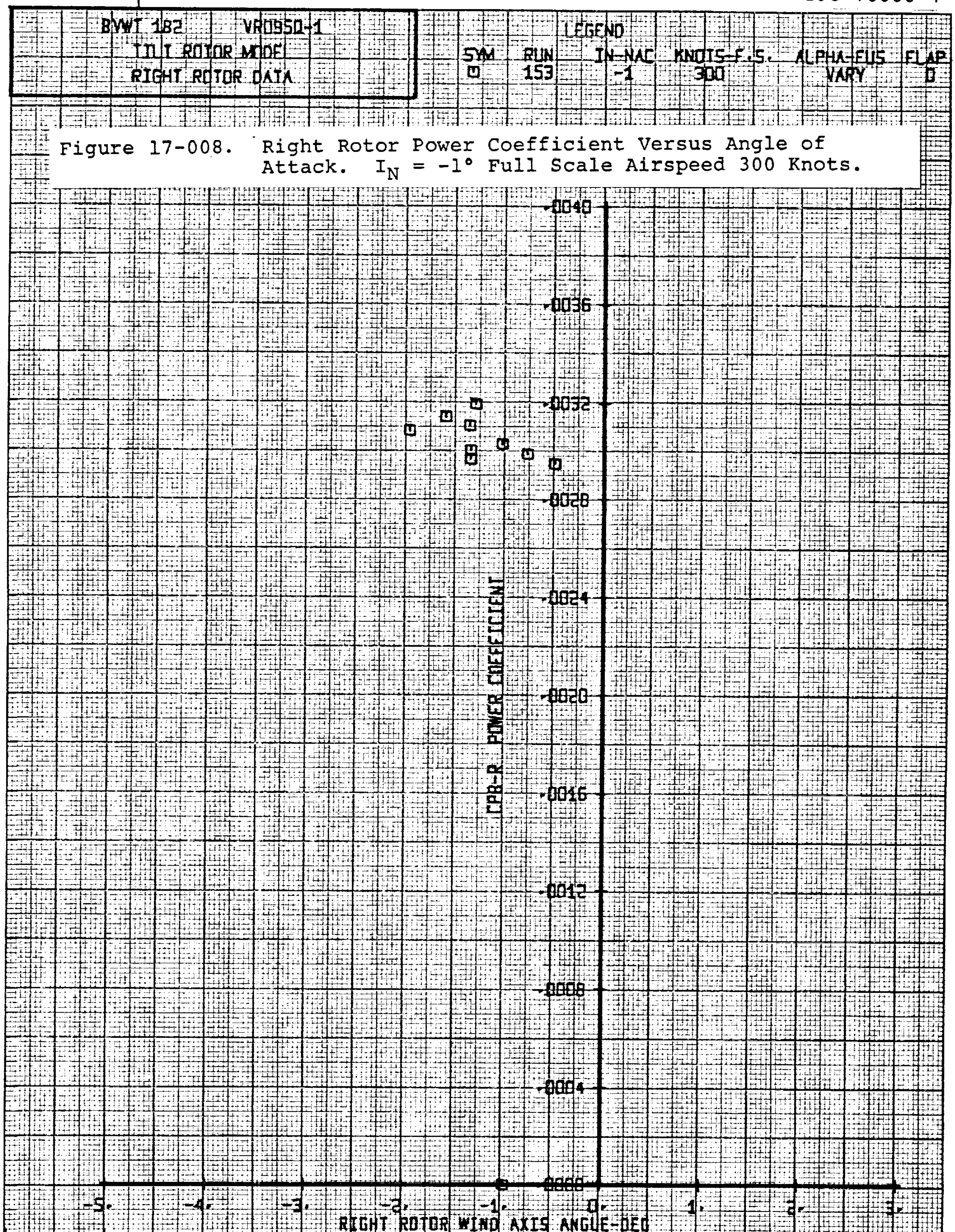


Figure 17-008. Right Rotor Power Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 300 Knots.

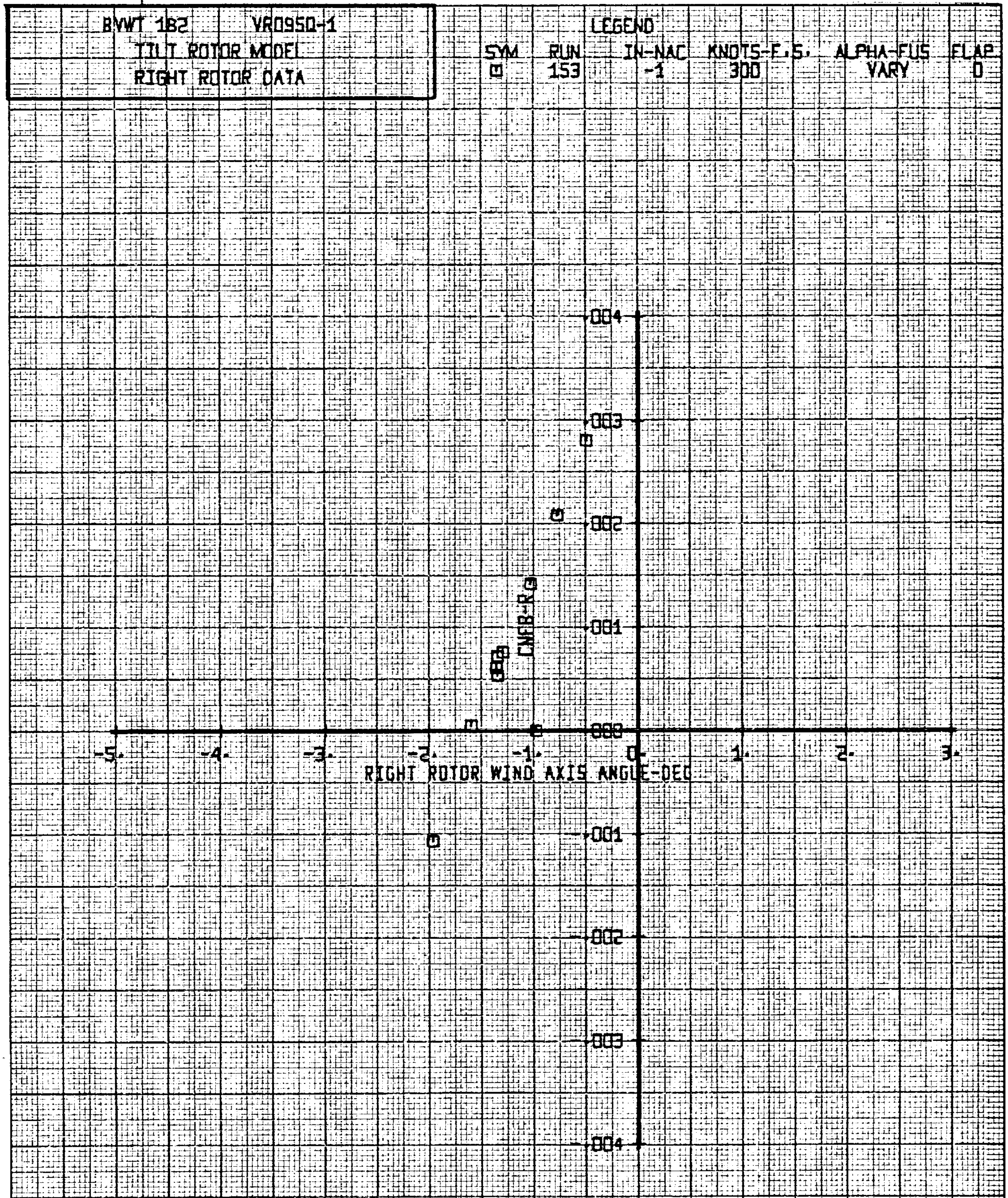


Figure 17-009. Right Rotor Normal Force Coefficient Versus Angle of Attack. I_N = -1° Full Scale Airspeed 300 Knots.

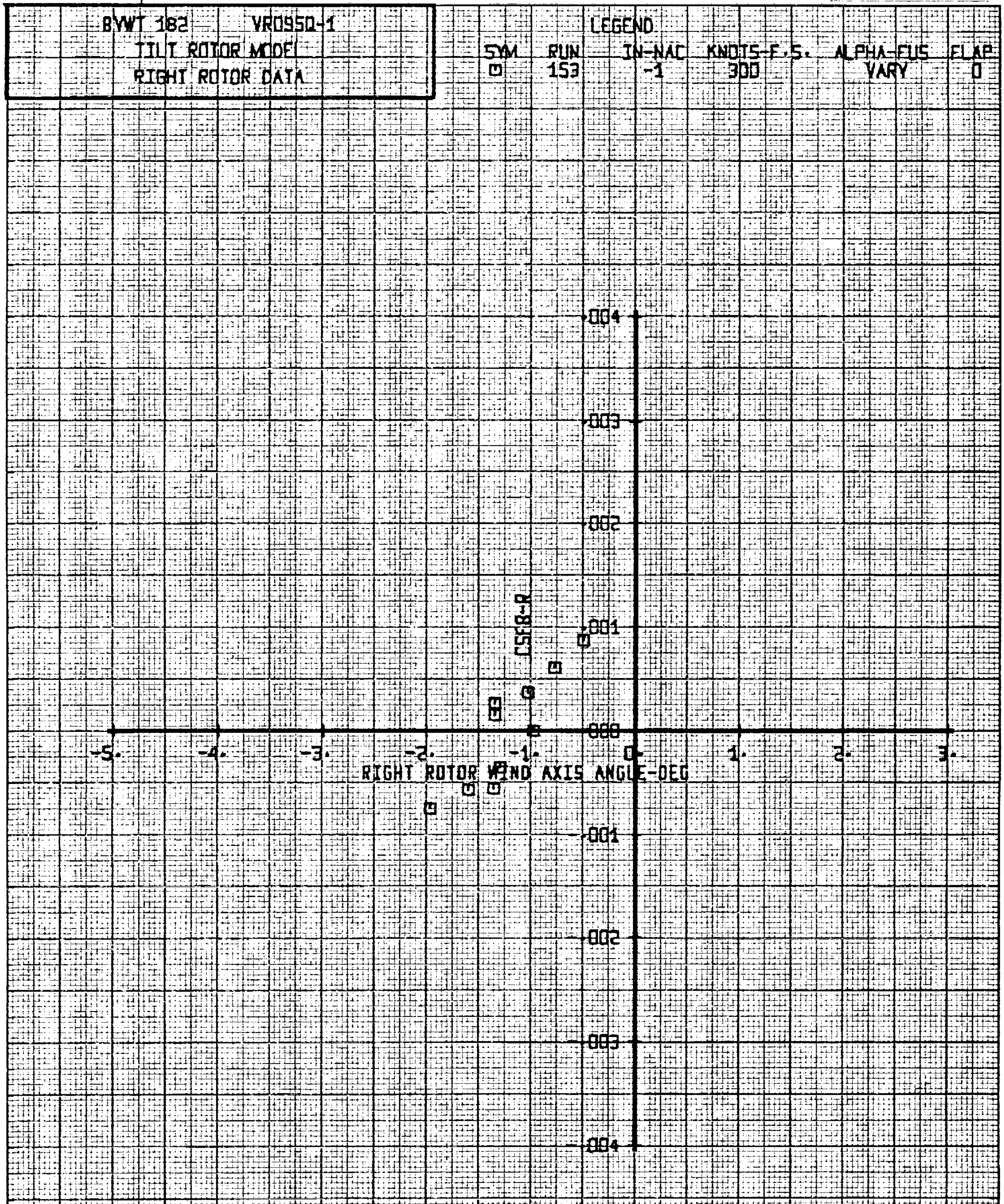


Figure 17-010. Right Rotor Side Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 300 Knots.

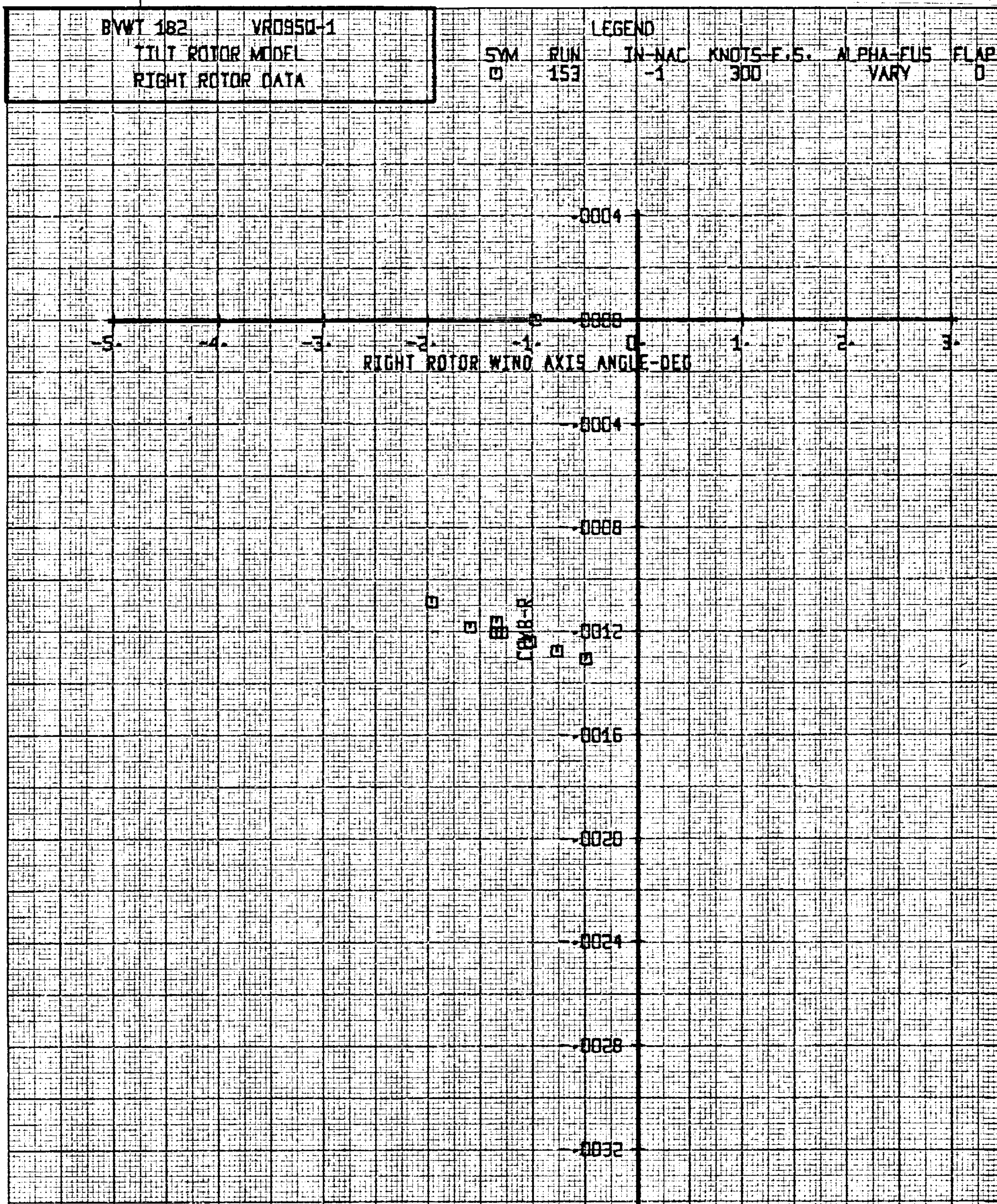


Figure 17-011. Right Rotor Pitching Moment Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 300 Knots.

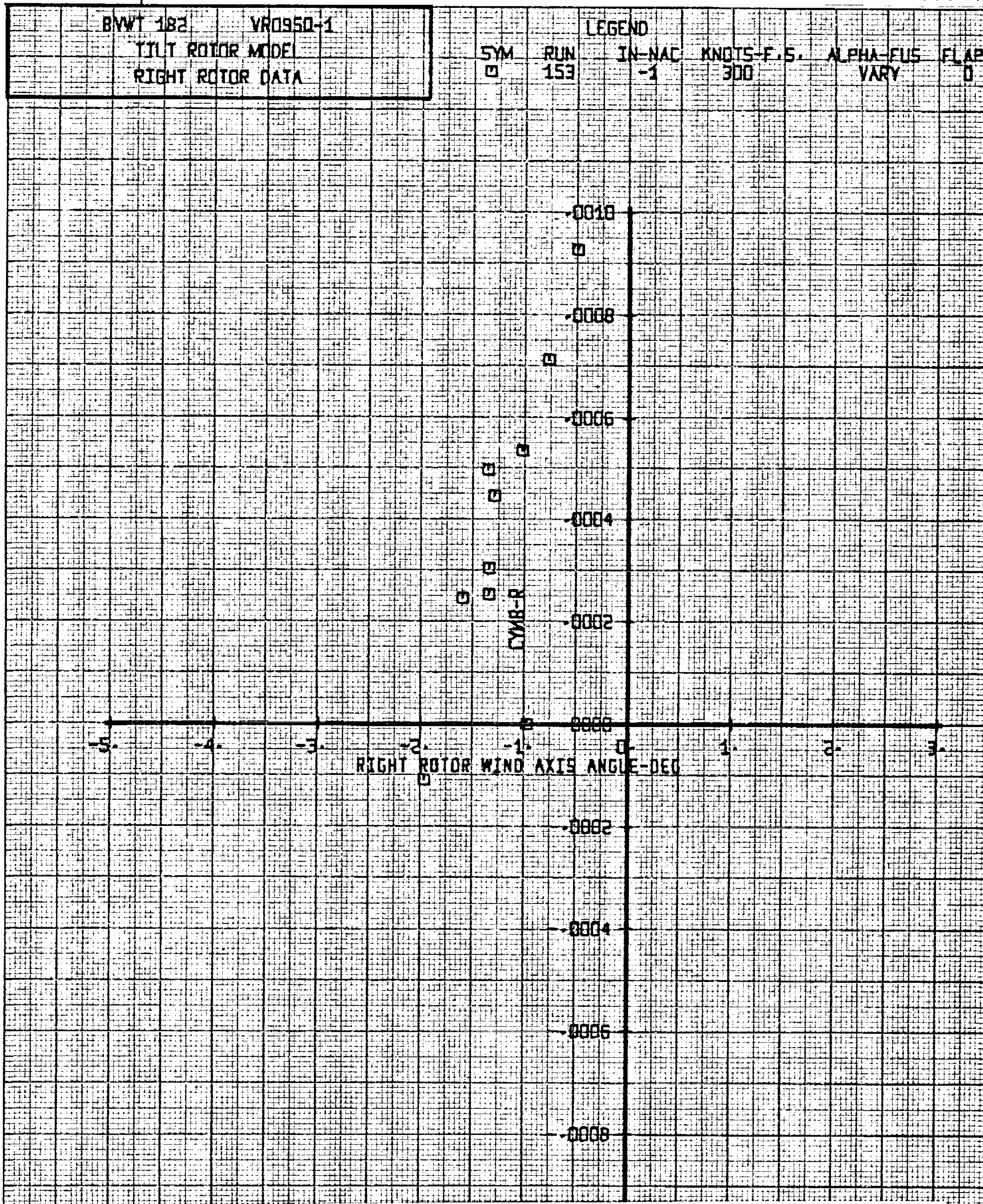


Figure 17-012. Right Rotor Yawing Moment Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 300 Knots.

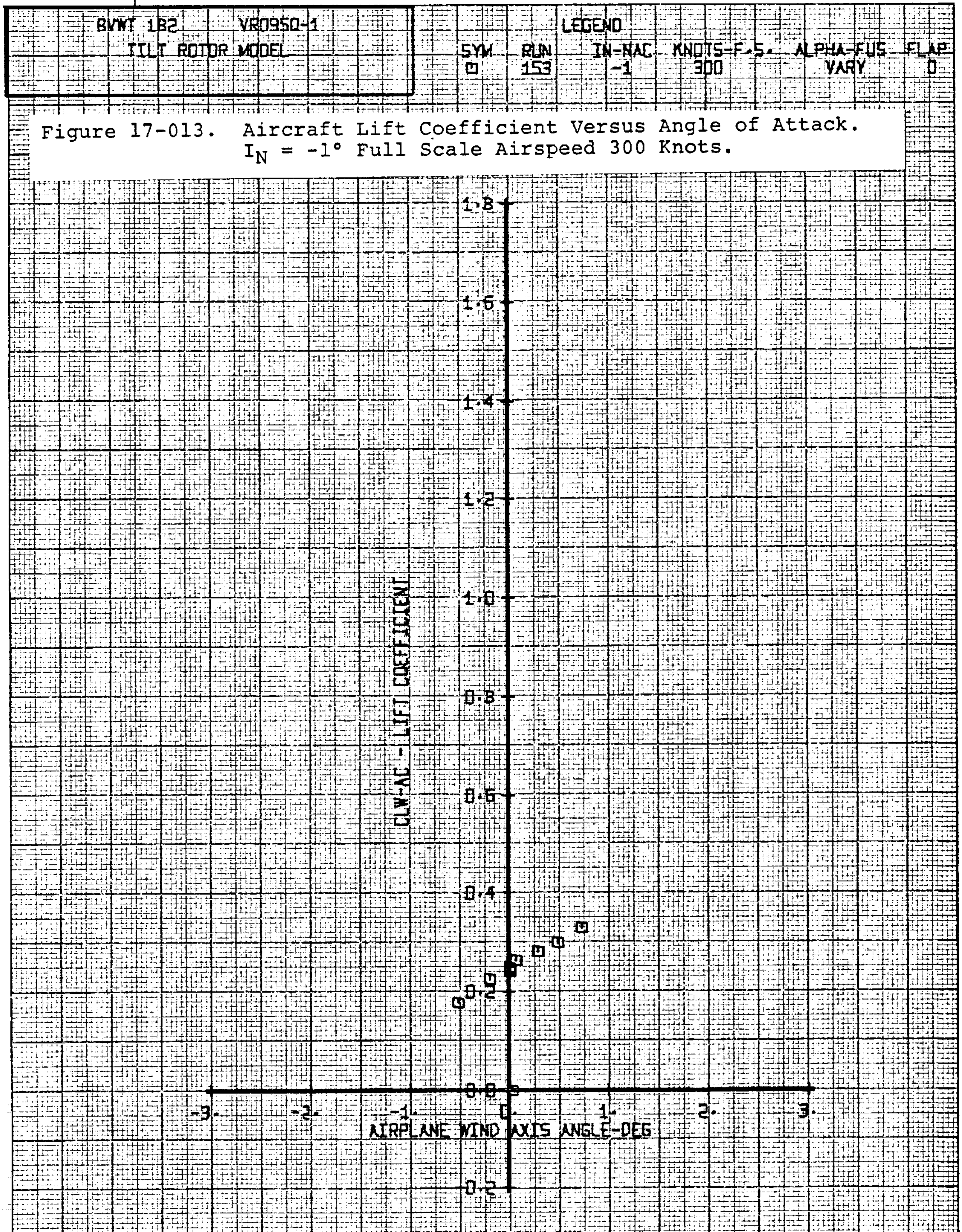


Figure 17-013. Aircraft Lift Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 300 Knots.

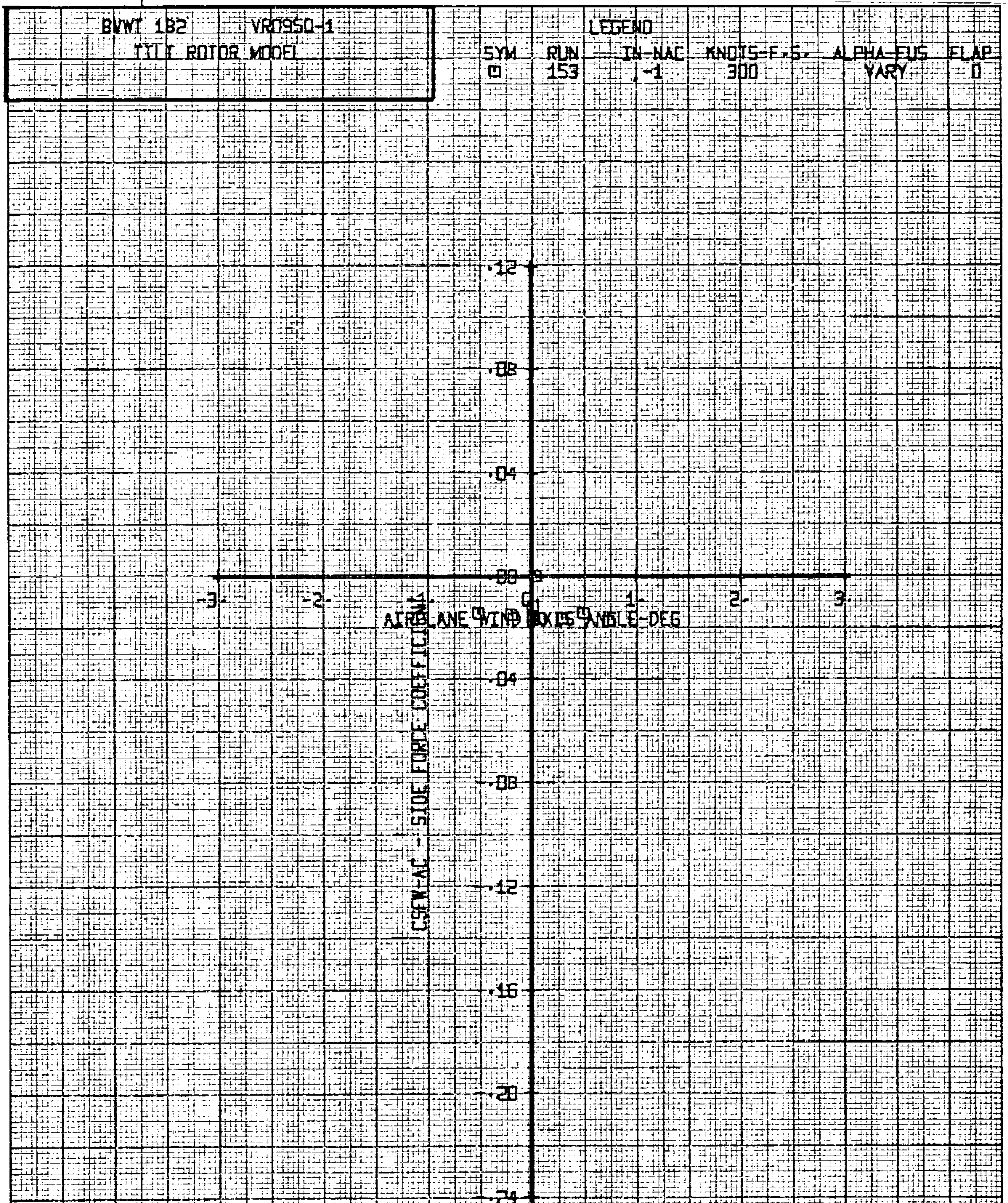


Figure 17-014. Aircraft Side Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 300 Knots.

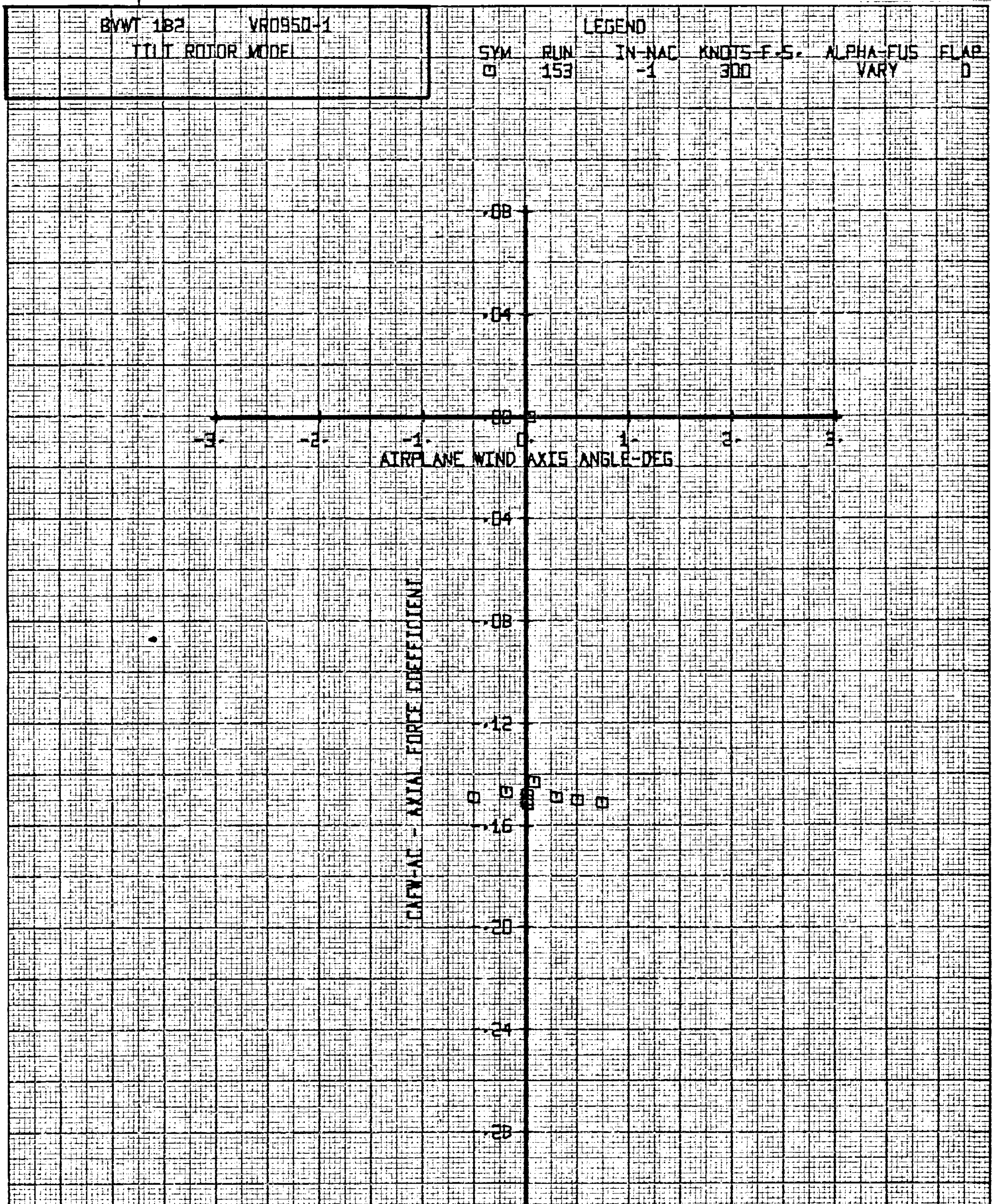


Figure 17-015. Aircraft Axial Force Coefficient Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 300 Knots.

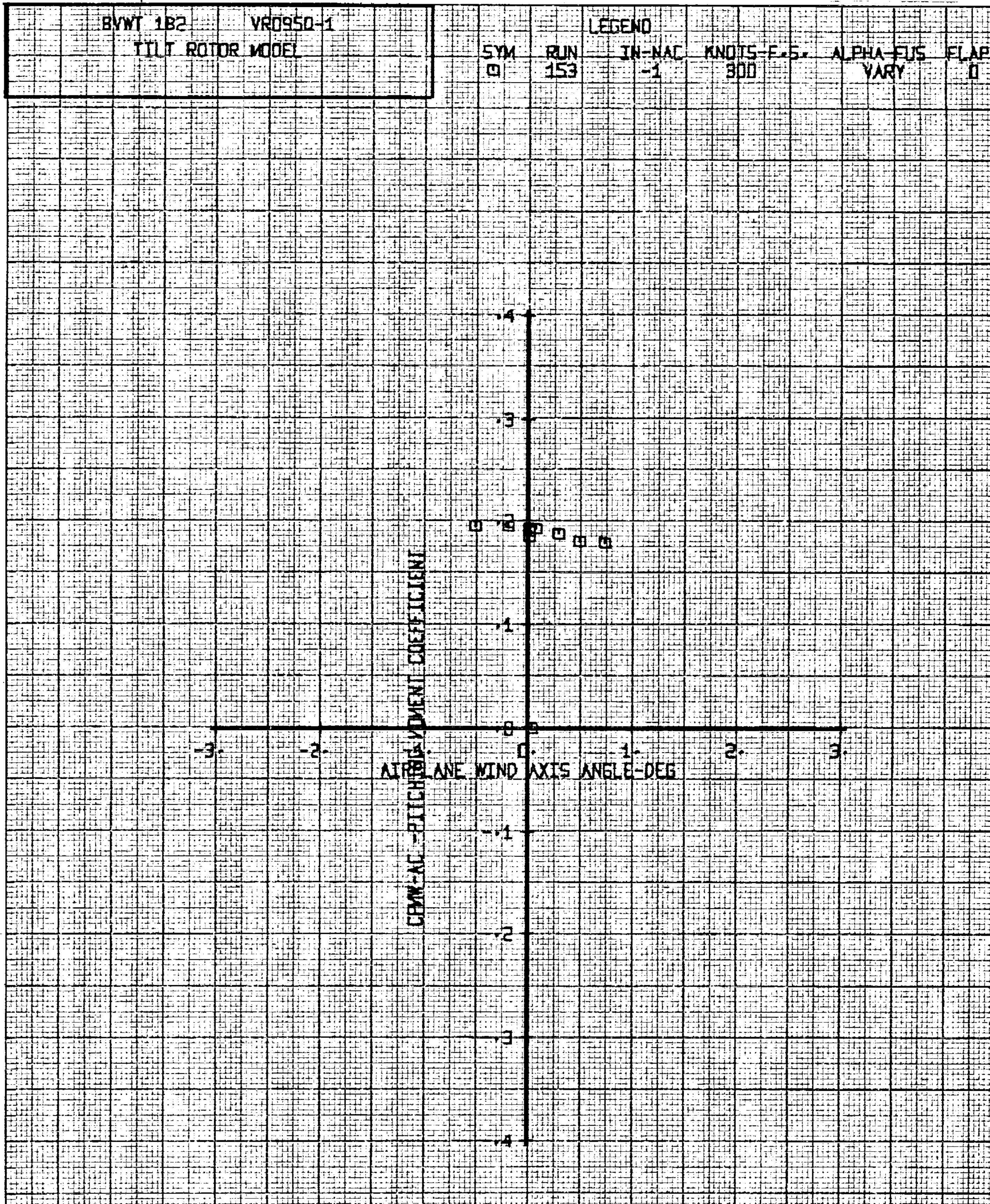


Figure 17-016. Aircraft Pitching Moment Versus Angle of Attack.
I_N = -1° Full Scale Airspeed 300 Knots.

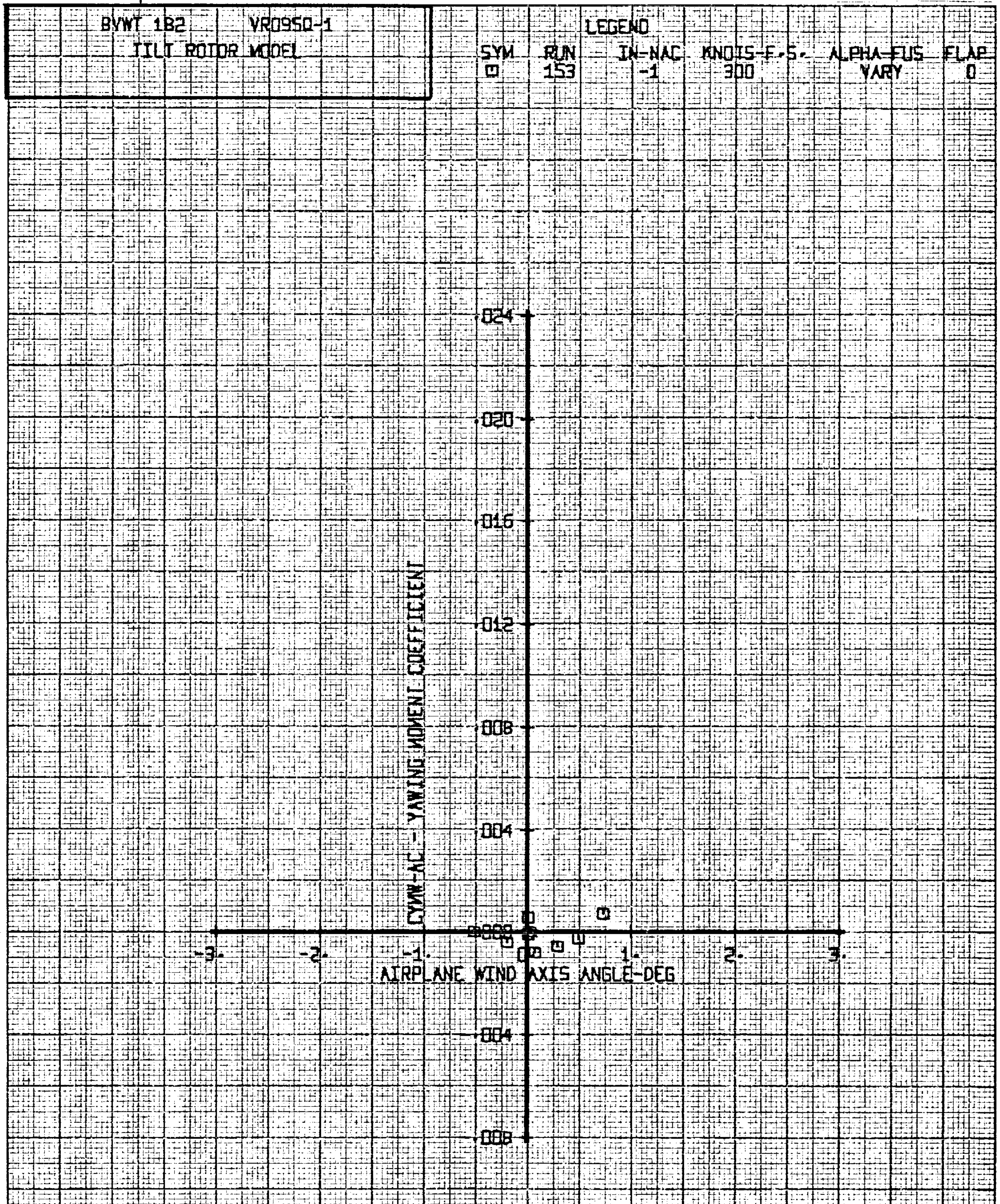


Figure 17-017. Aircraft Yawing Moment Versus Angle of Attack. $I_N = -1°$ Full Scale Airspeed 300 Knots.

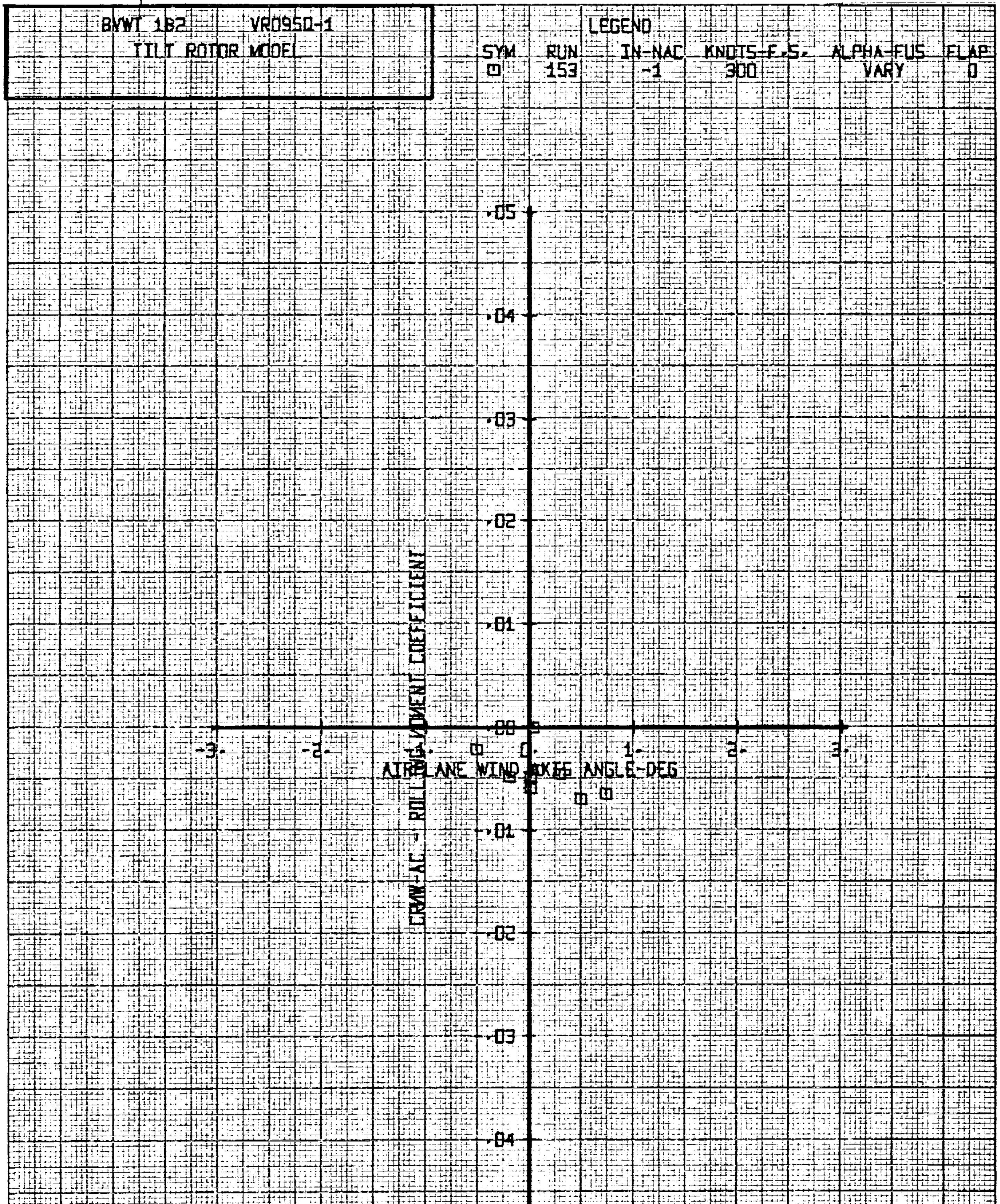


Figure 17-018. Aircraft Rolling Moment Versus Angle of Attack. I_N = -1° Full Scale Airspeed 300 Knots.

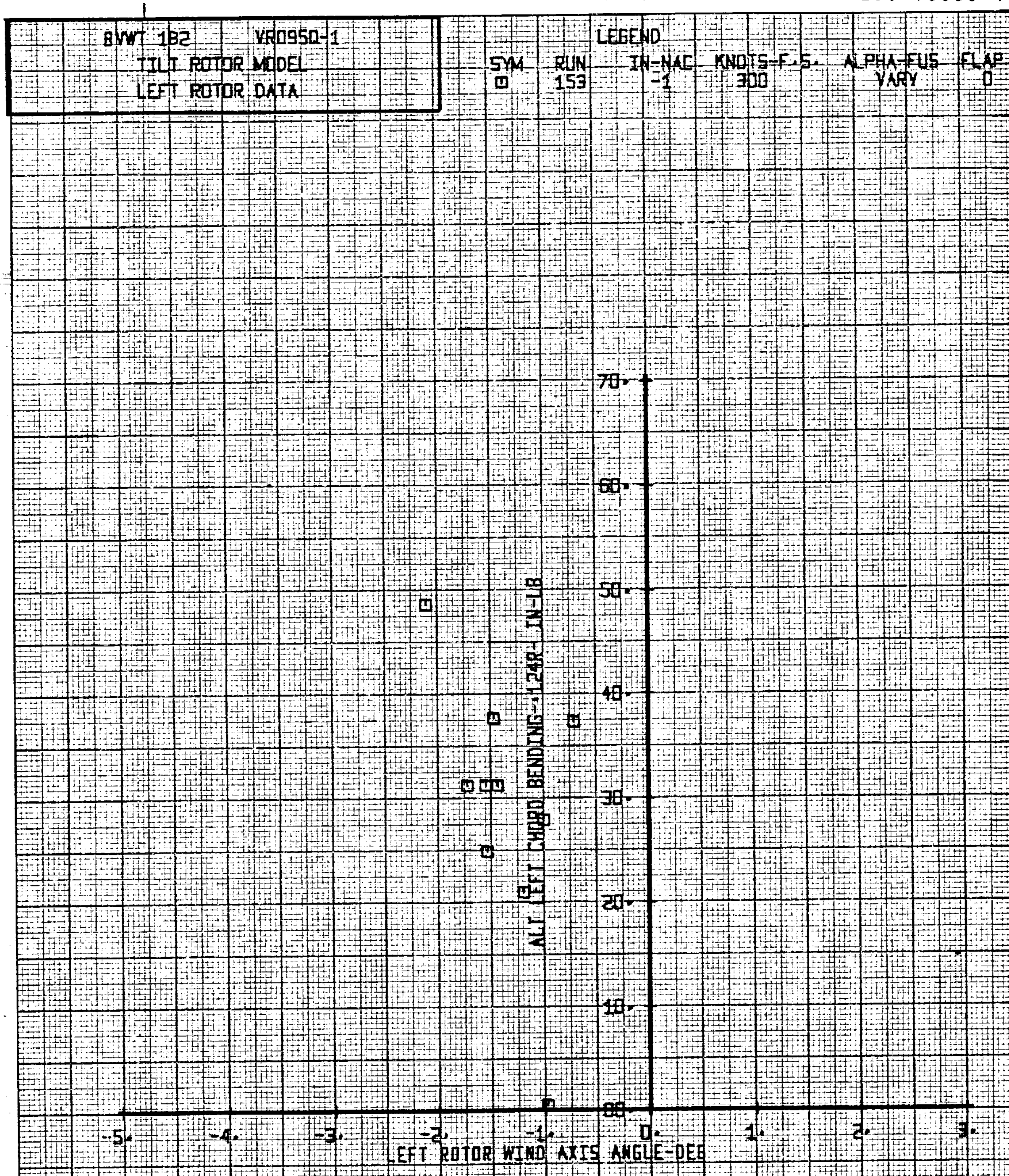


Figure 17-019. Alt. Left Chord Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 300 Knots.

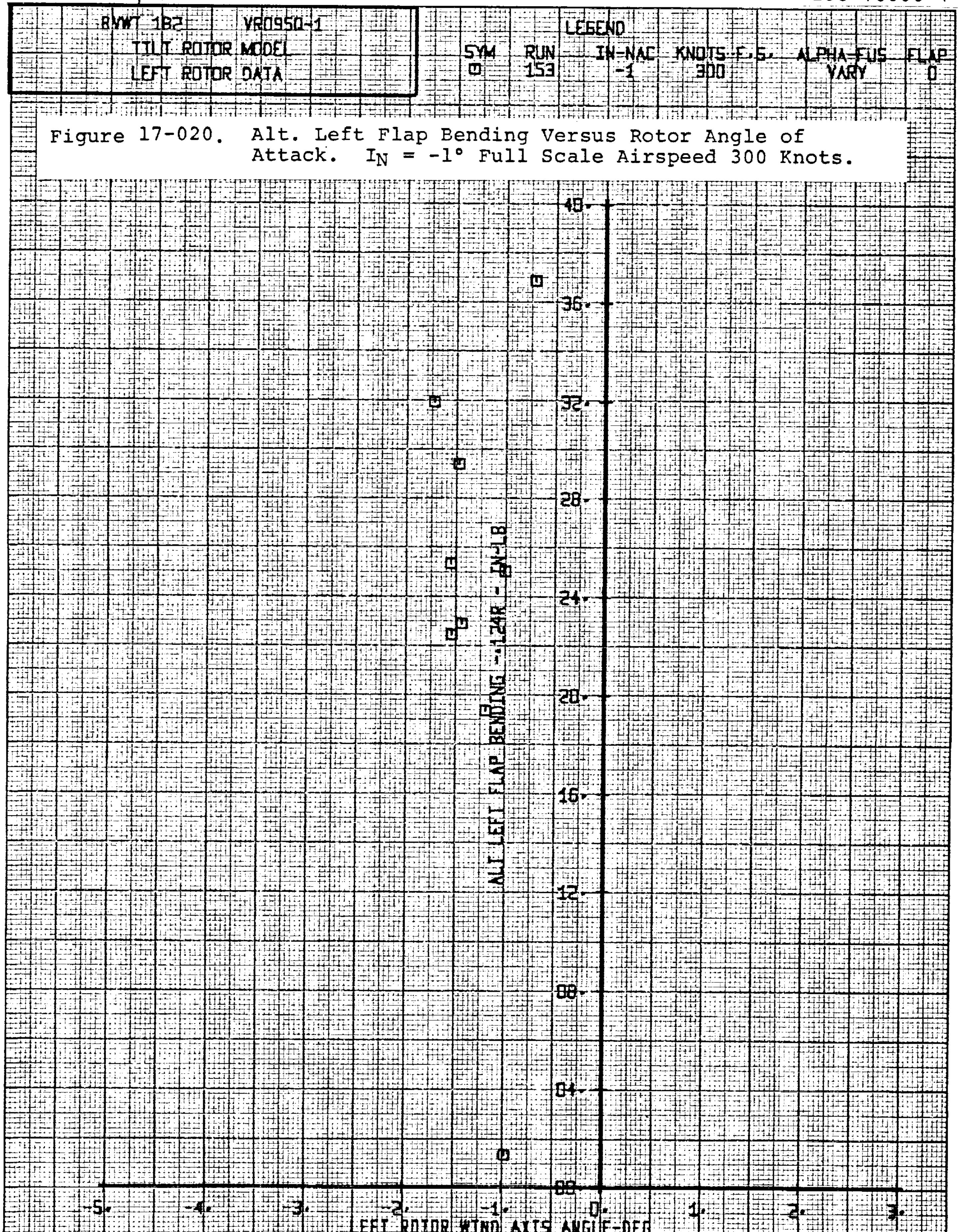


Figure 17-020. Alt. Left Flap Bending Versus Rotor Angle of Attack. I_N = -1° Full Scale Airspeed 300 Knots.

104
182

SET 104
BVWT 182

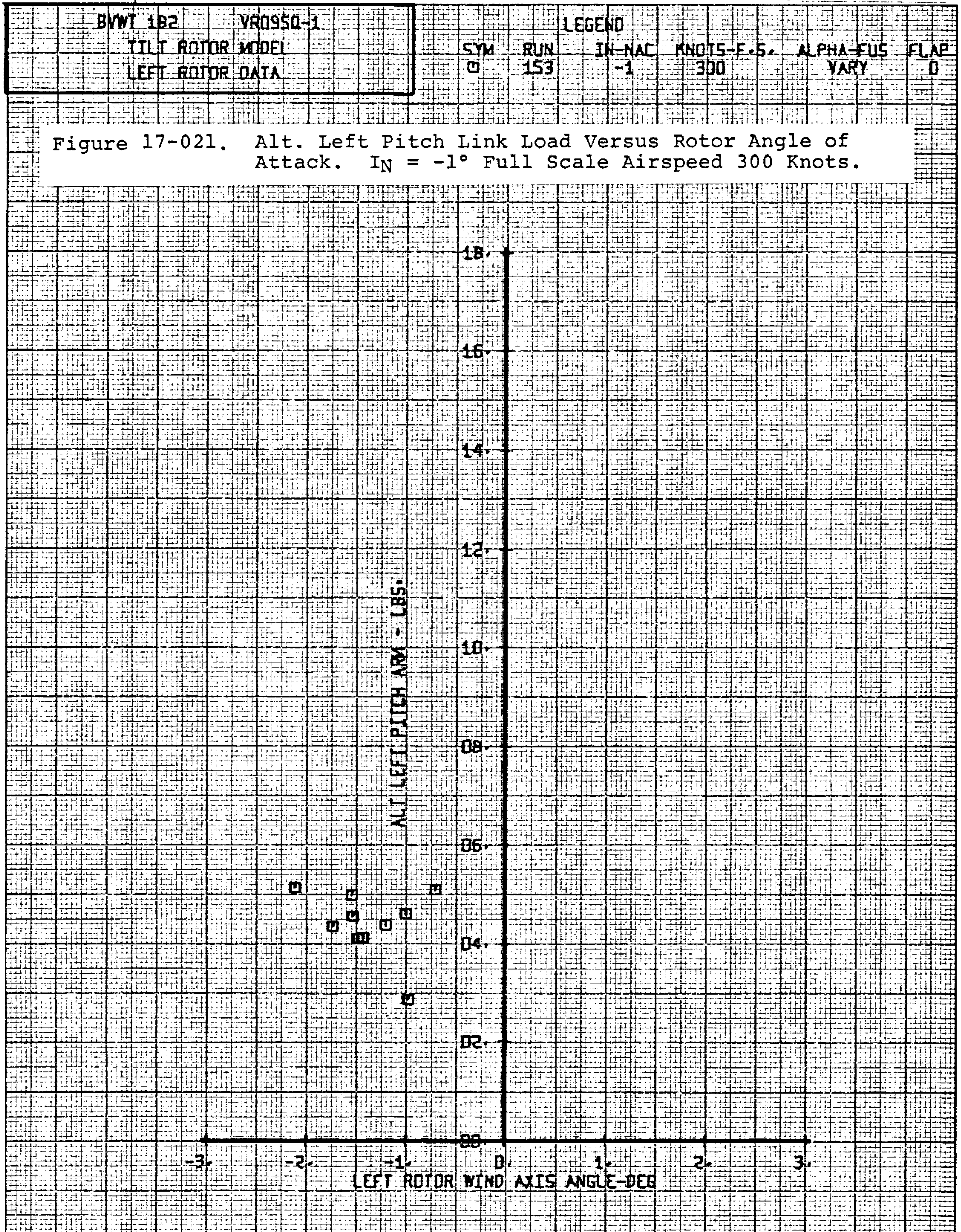


Figure 17-021. Alt. Left Pitch Link Load Versus Rotor Angle of Attack. I_N = -1° Full Scale Airspeed 300 Knots.

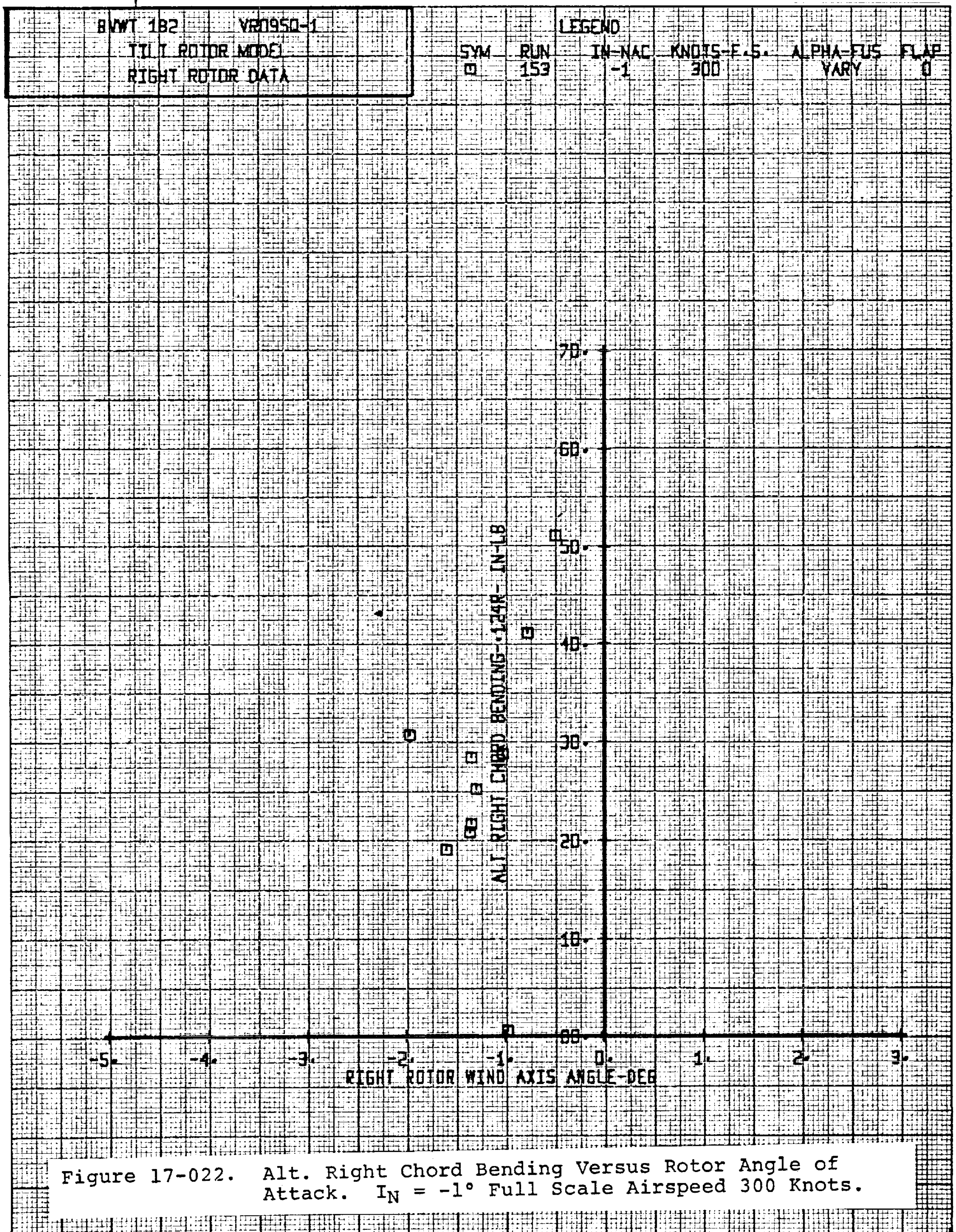


Figure 17-022. Alt. Right Chord Bending Versus Rotor Angle of Attack. I_N = -1° Full Scale Airspeed 300 Knots.

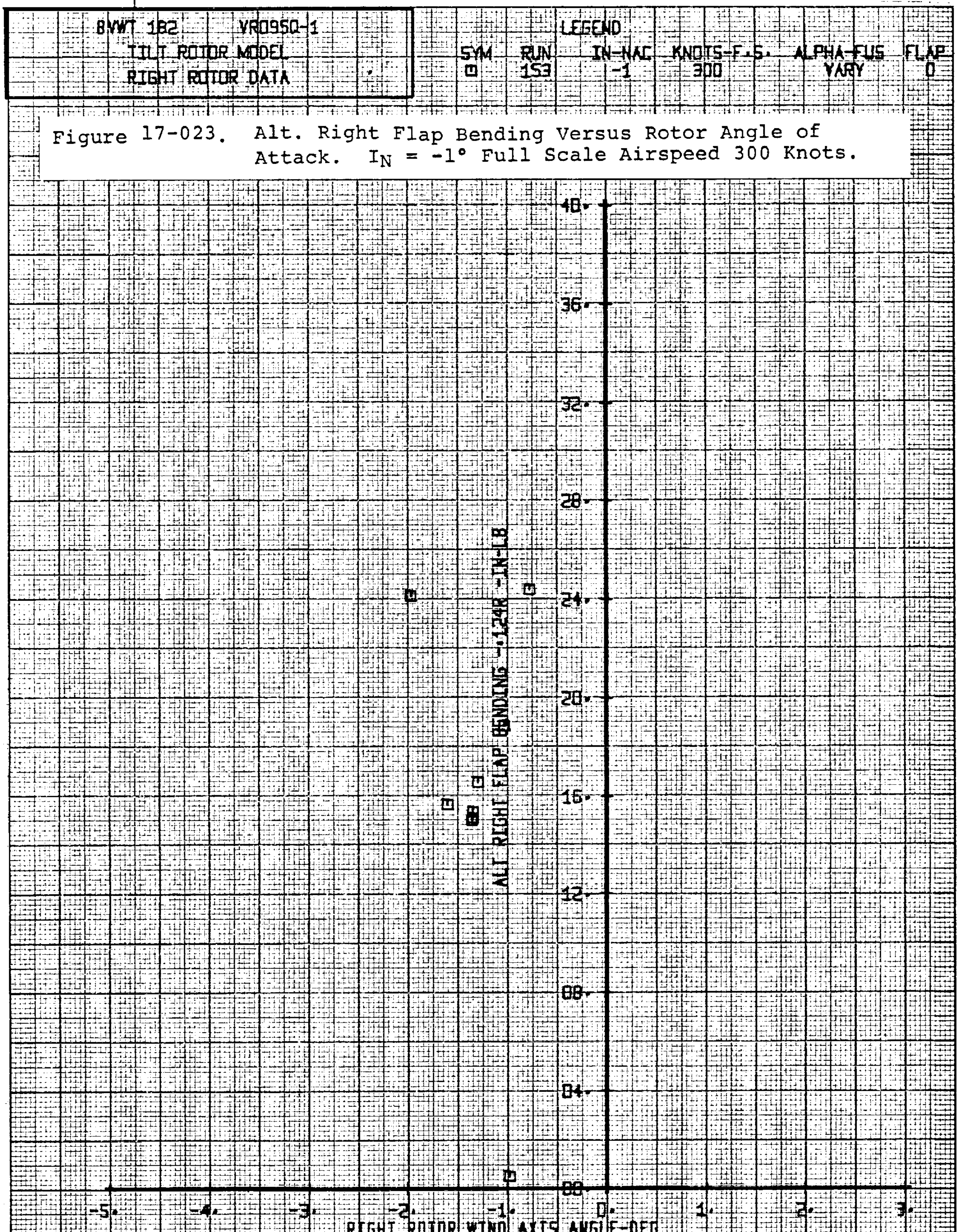


Figure 17-023. Alt. Right Flap Bending Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 300 Knots.

BVWT 182 VR0950-1
TILT ROTOR MODEL
RIGHT ROTOR DATA

LEGEND

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	153	-1	300	VARY	0

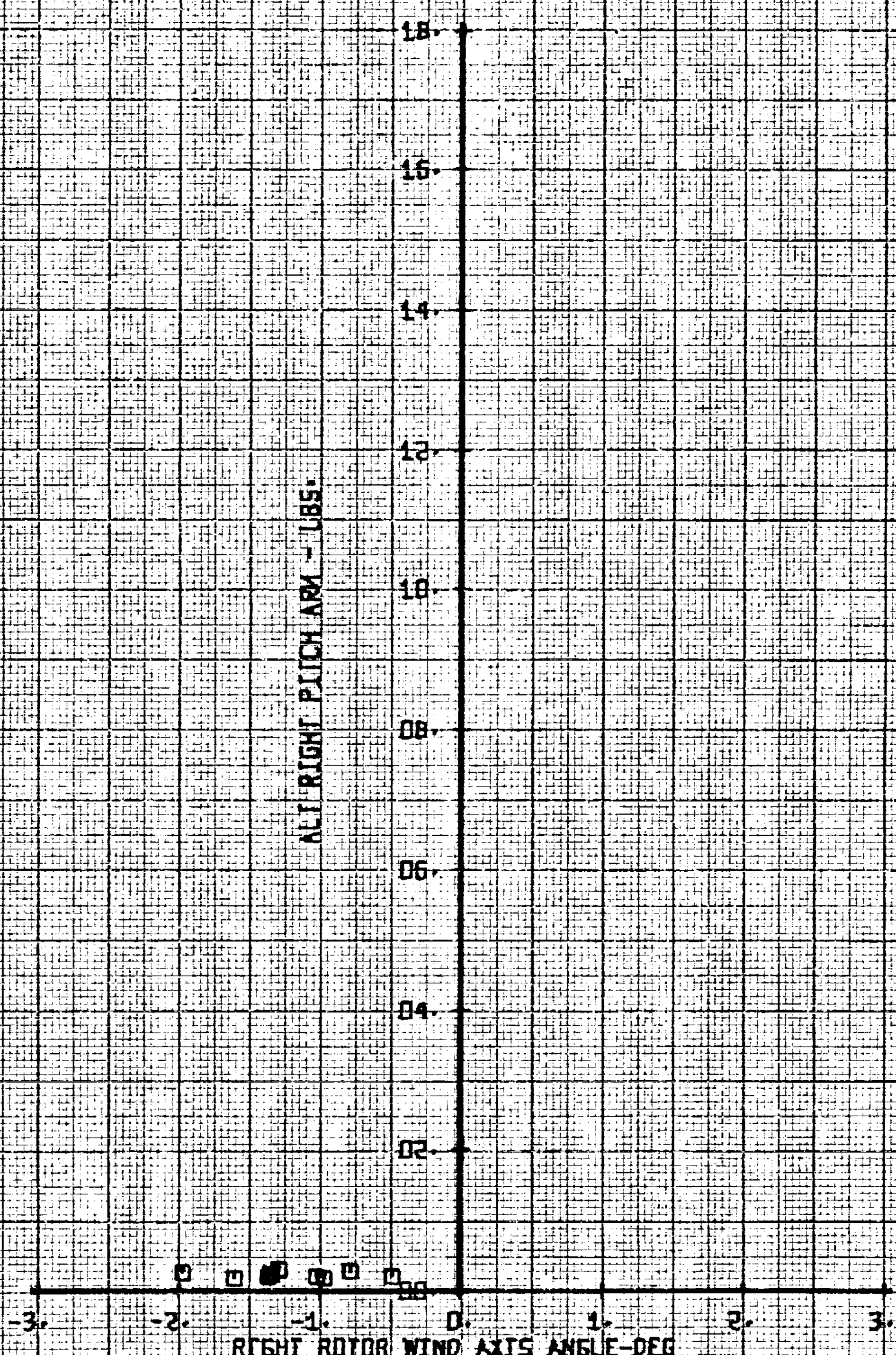


Figure 17-024. Alt. Right Pitch Link Load Versus Rotor Angle of Attack. $I_N = -1°$ Full Scale Airspeed 300 Knots.

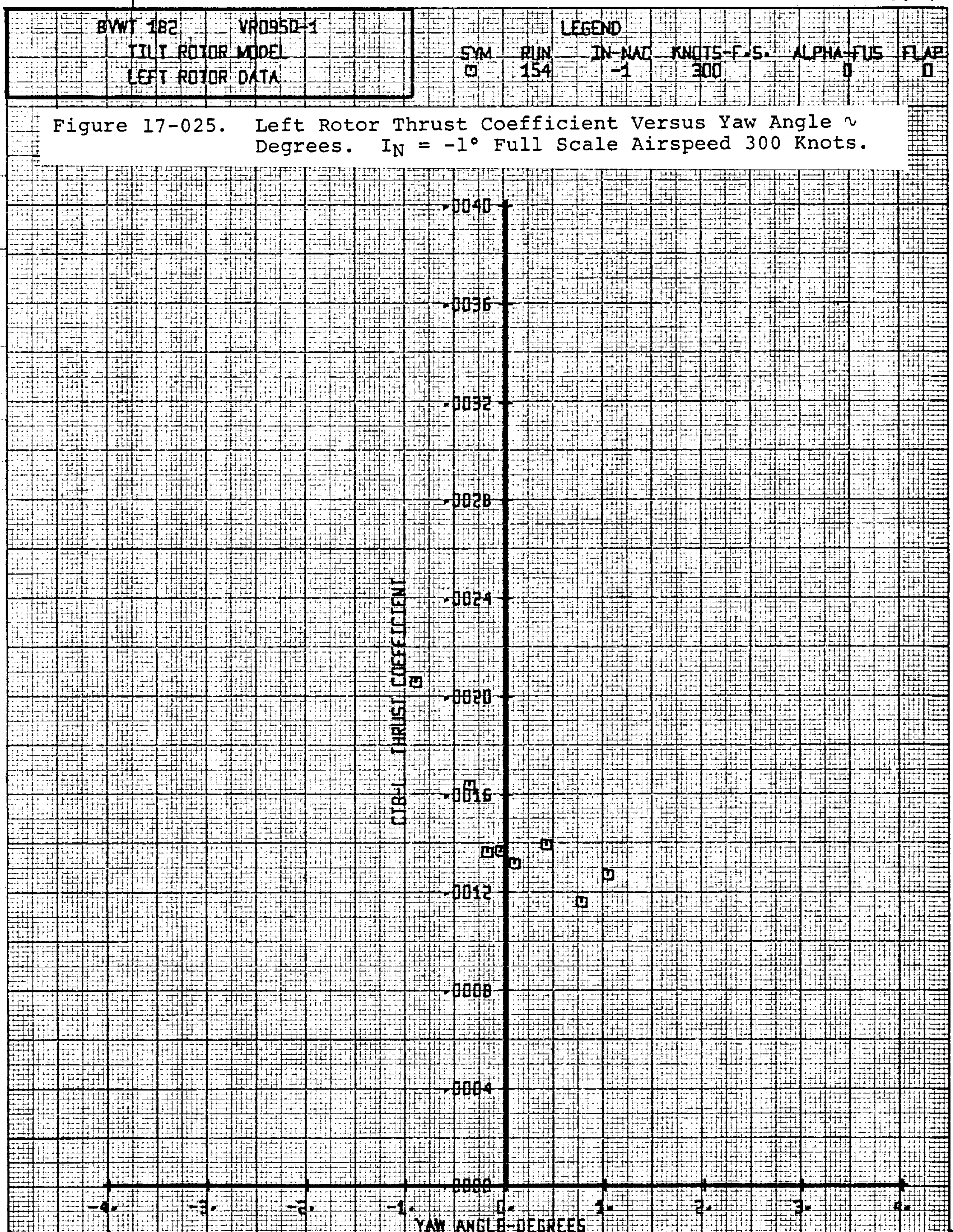
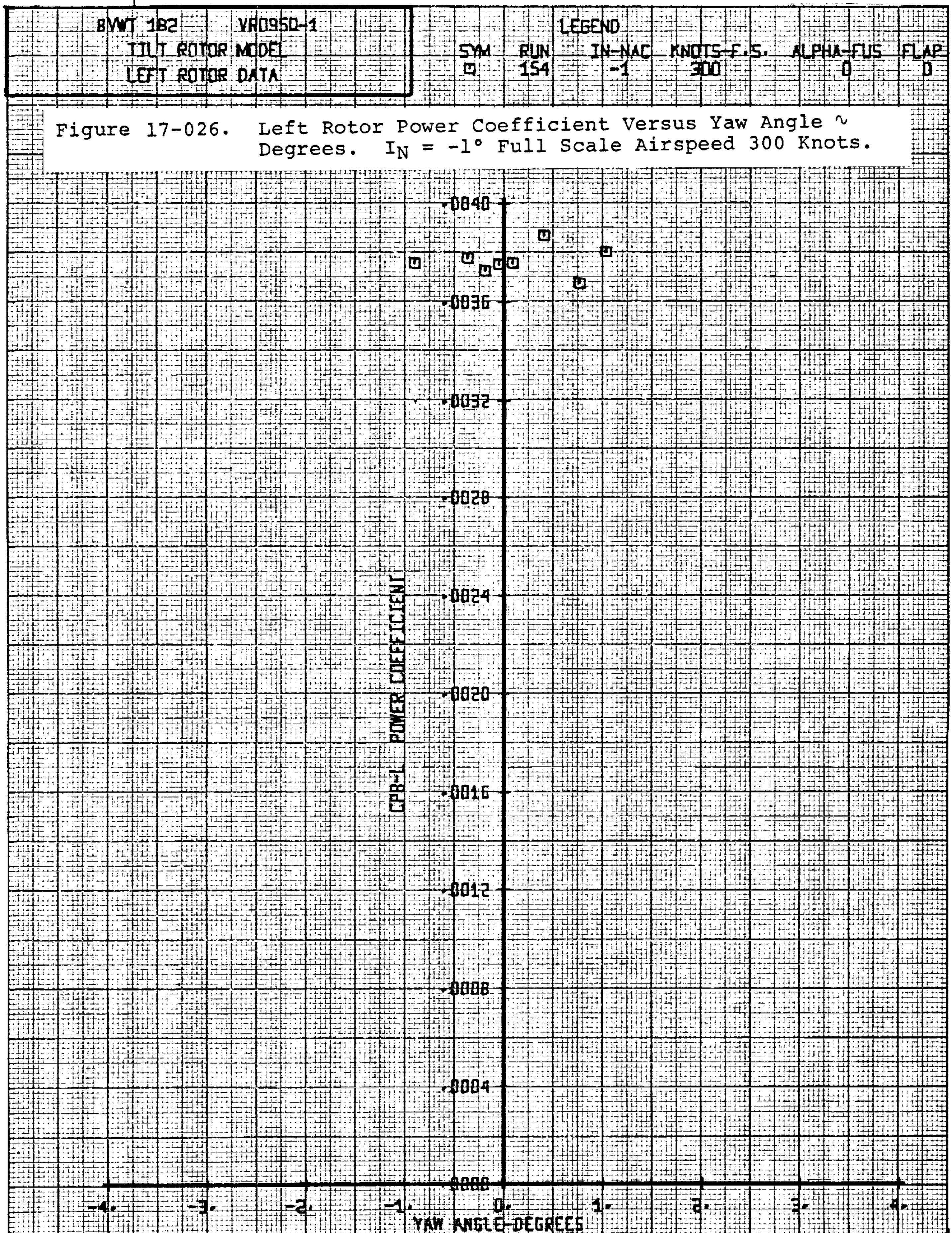


Figure 17-025. Left Rotor Thrust Coefficient Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 300 Knots.

Figure 17-026. Left Rotor Power Coefficient Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.



105
182

SET 105
BVWT 182

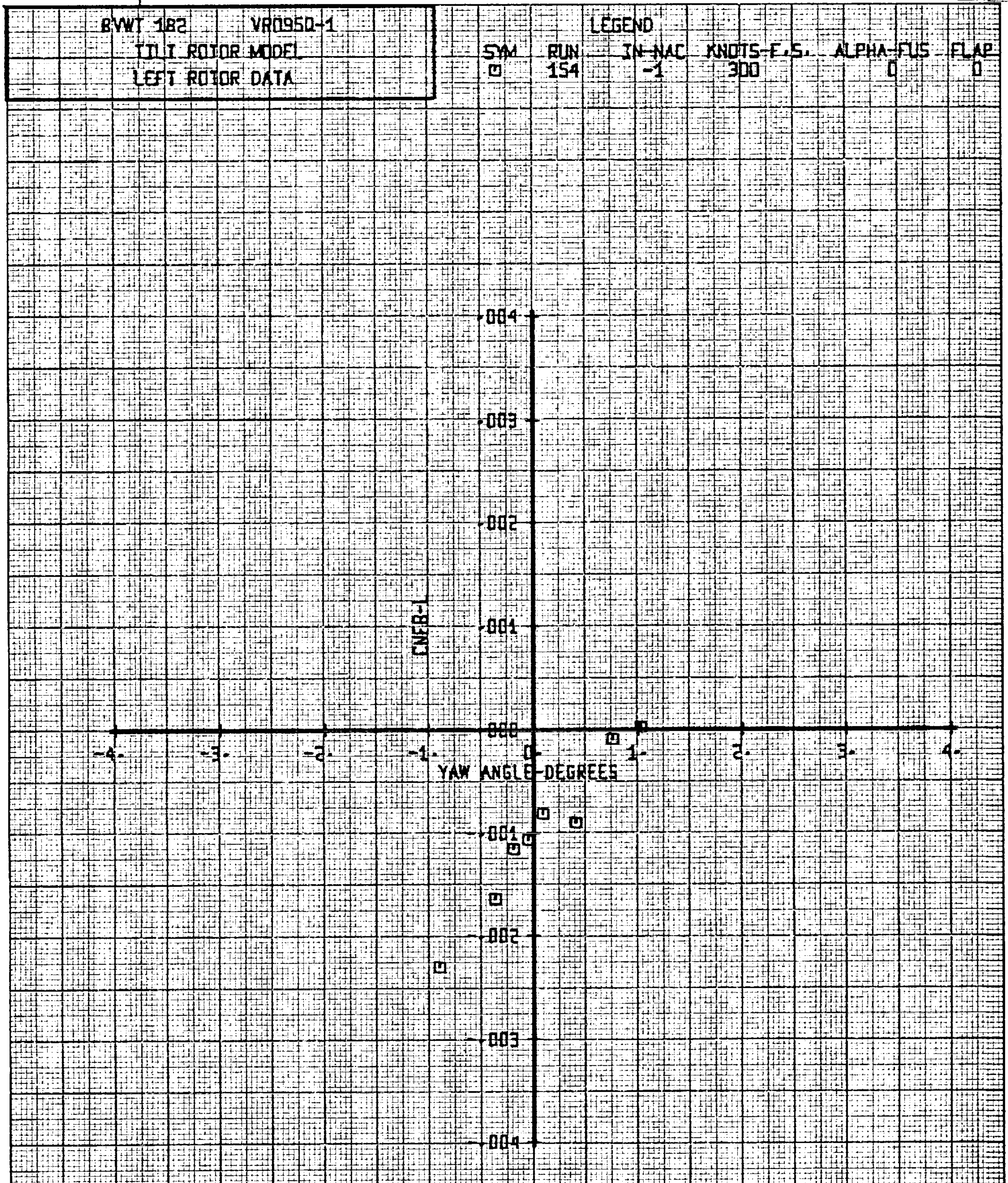


Figure 17-027. Left Rotor Normal Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

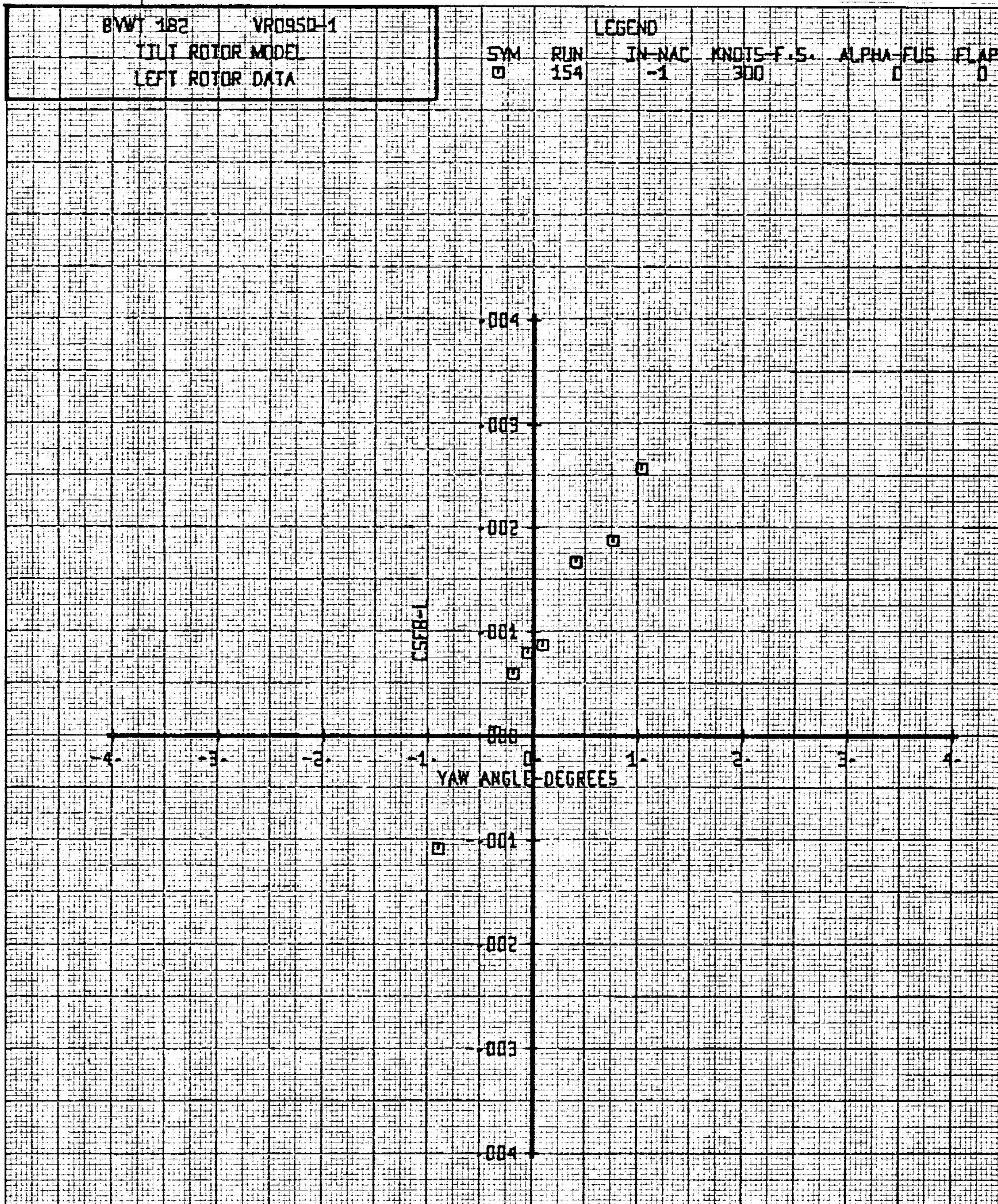


Figure 17-028. Left Rotor Side Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

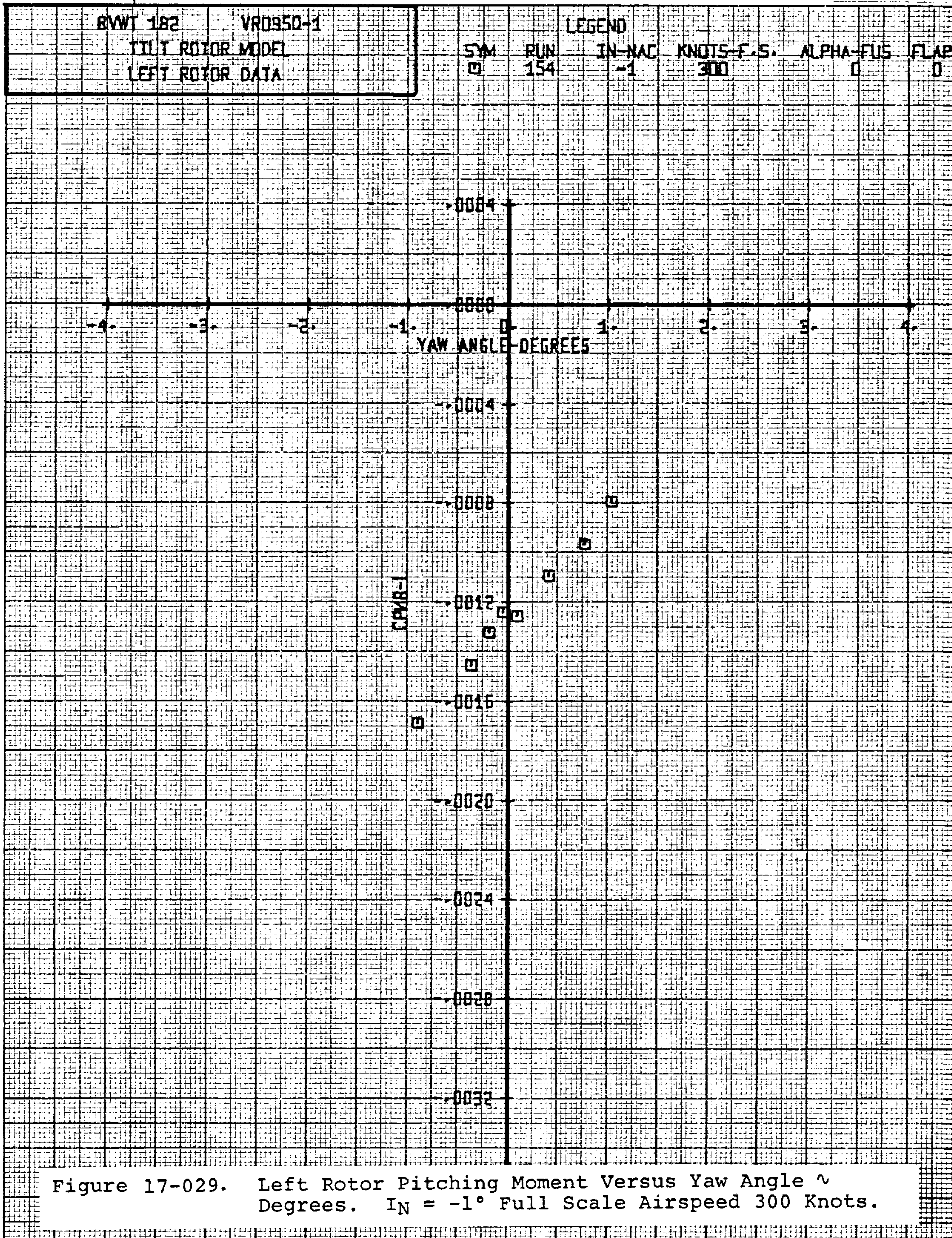


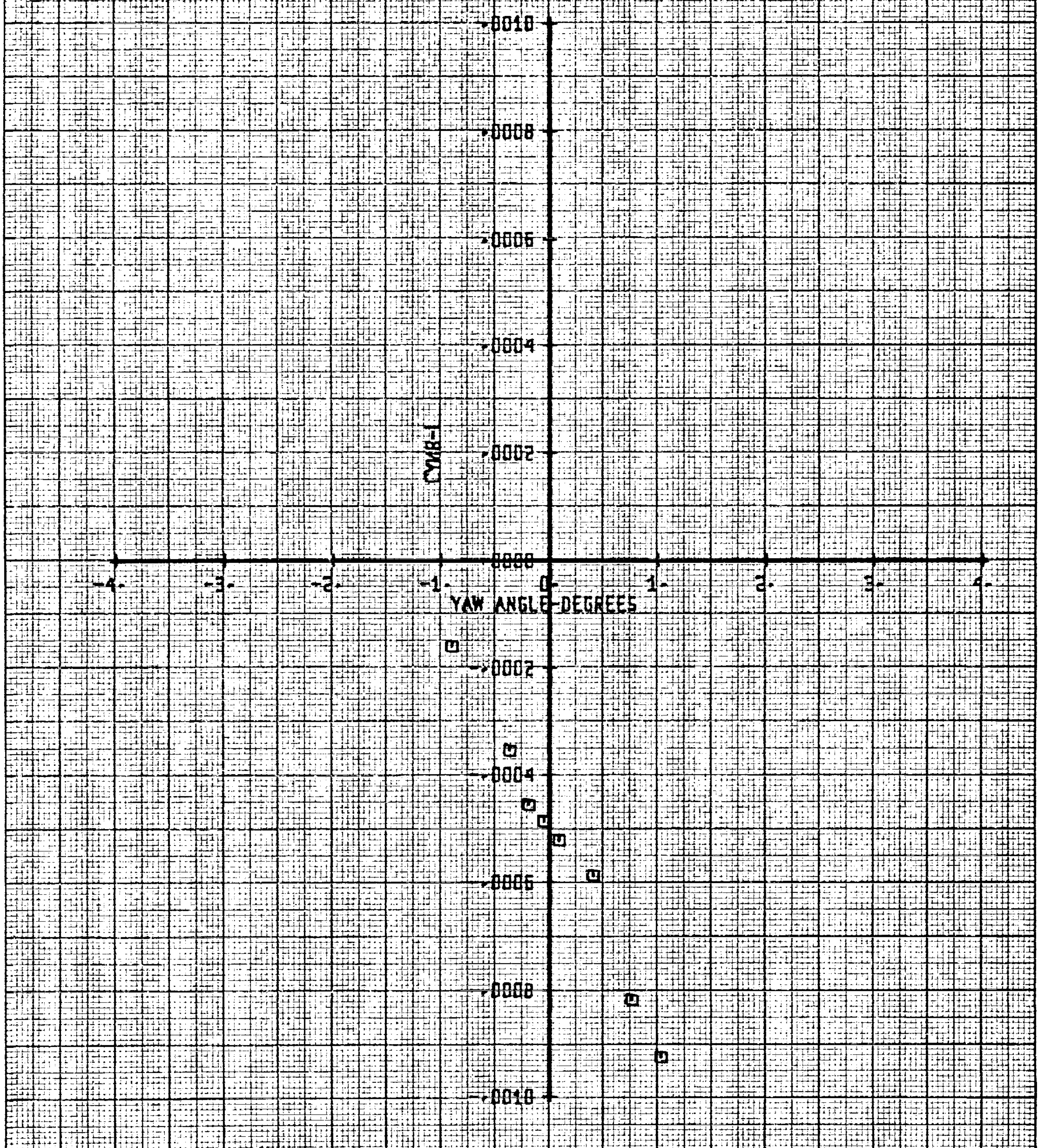
Figure 17-029. Left Rotor Pitching Moment Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

BVWT 182	VR095D-1
TILT ROTOR MODEL	
LEFT ROTOR DATA	

LEGEND

SYM	RUN	IN-NAC	KNOTS-F.S.	ALPHA-FUS	FLAP
⊡	154	-1	300	0	0

Figure 17-030. Left Rotor Yawing Moment Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 300 Knots.



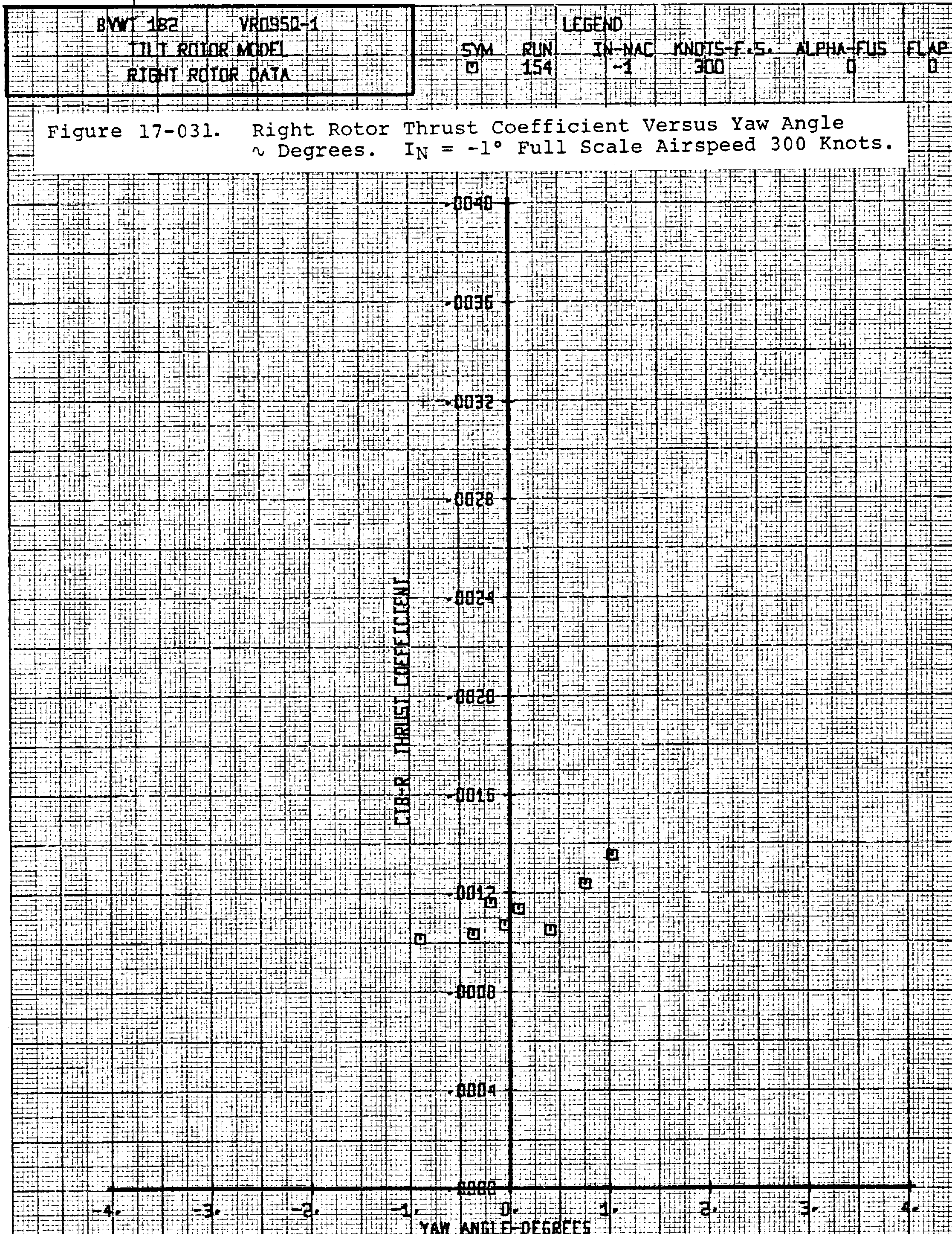


Figure 17-031. Right Rotor Thrust Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

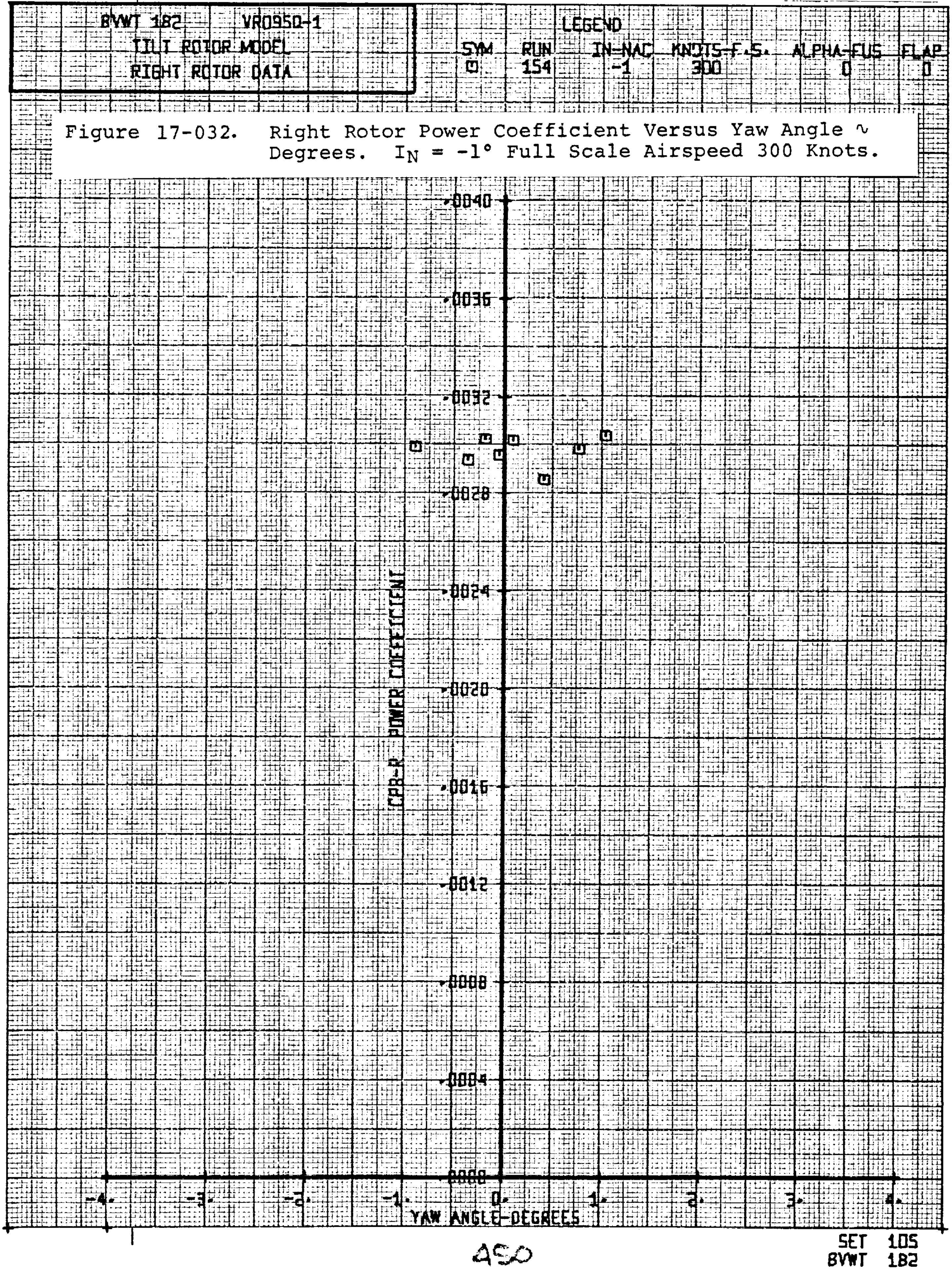


Figure 17-032. Right Rotor Power Coefficient Versus Yaw Angle ∿ Degrees. I_N = -1° Full Scale Airspeed 300 Knots.

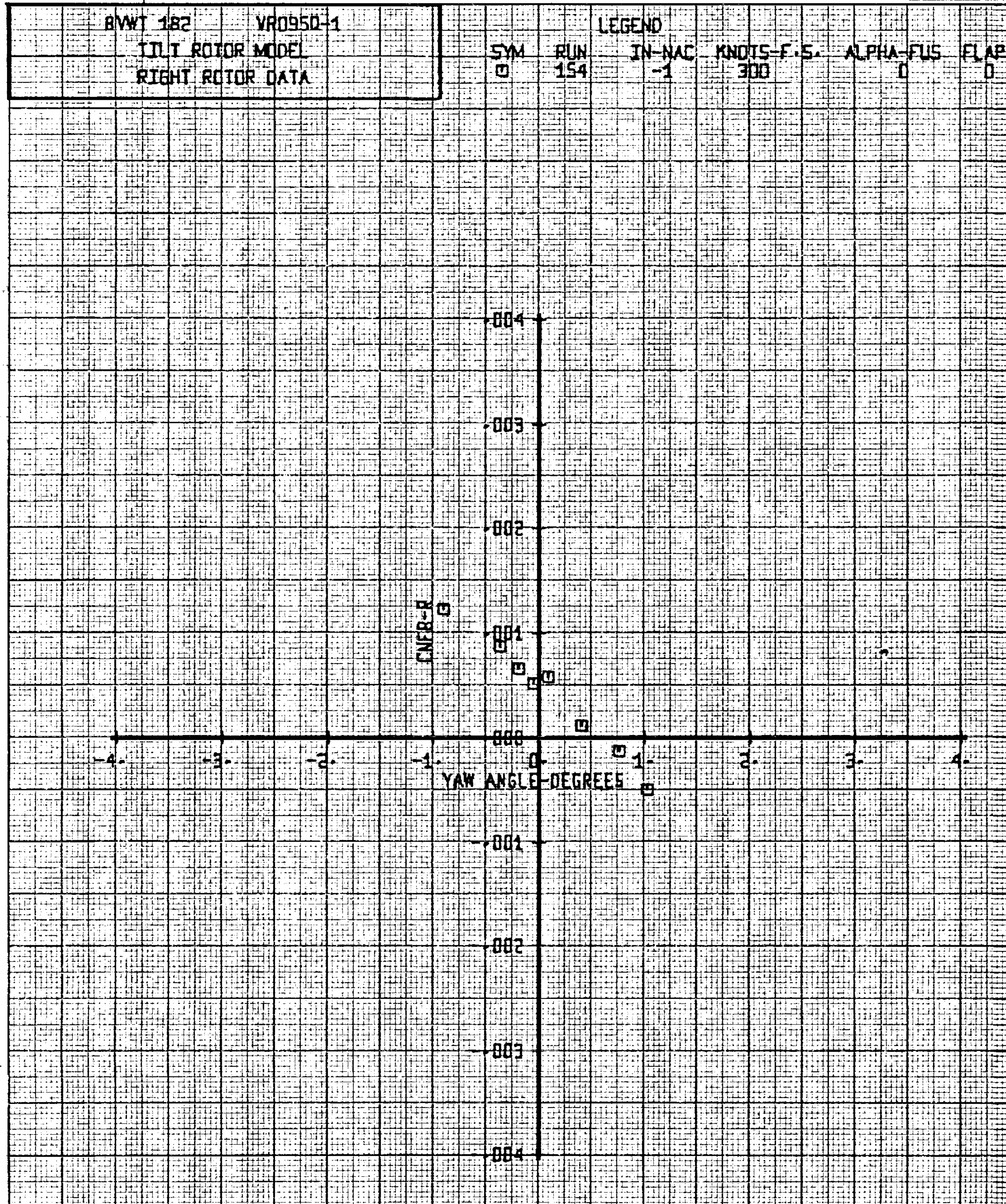


Figure 17-033. Right Rotor Normal Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = -1° Full Scale Airspeed 300 Knots.

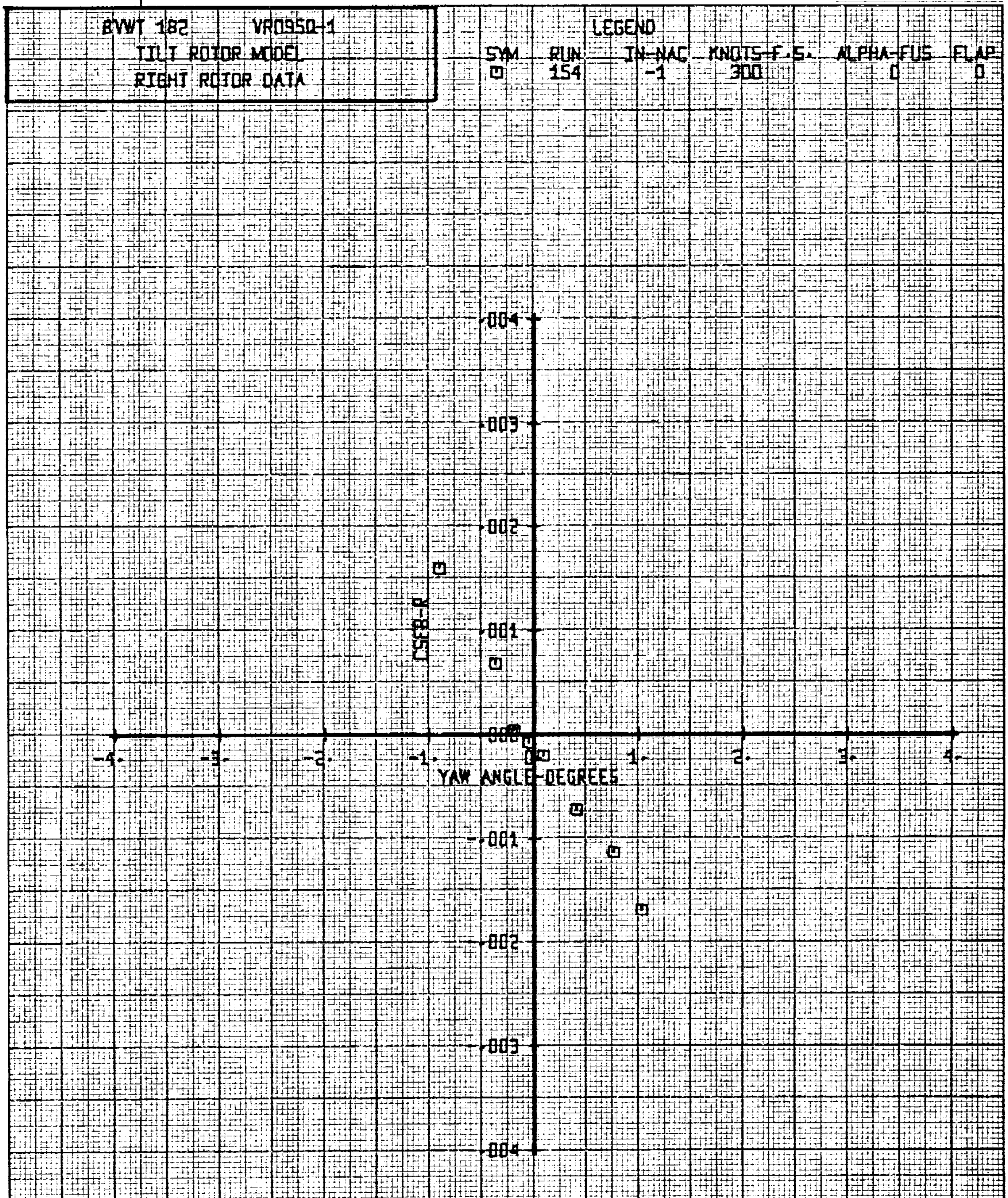


Figure 17-034. Right Rotor Side Force Coefficient Versus Yaw Angle ∿ Degrees. I_N = -1P Full Scale Airspeed 300 Knots.

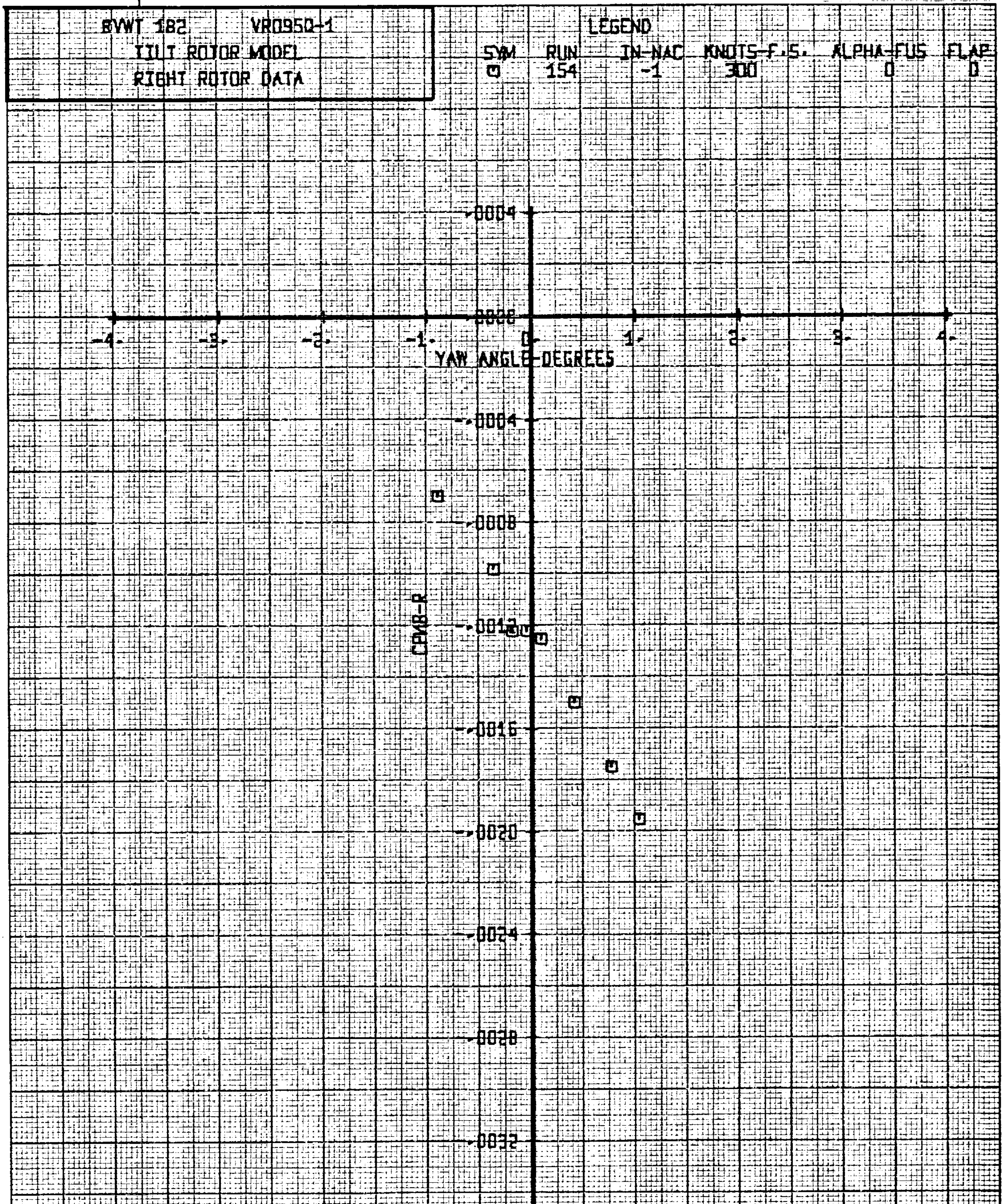


Figure 17-035. Right Rotor Pitching Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

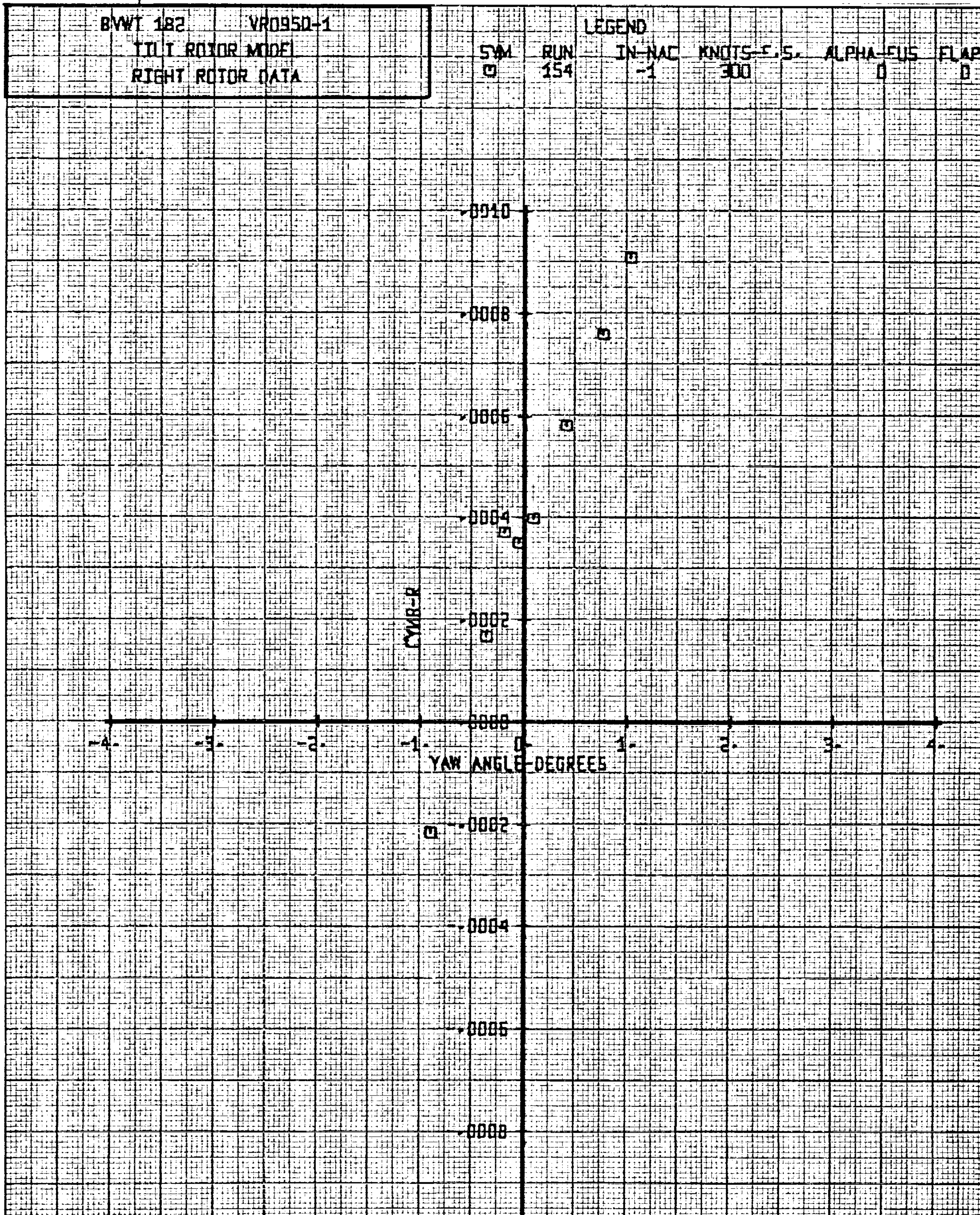


Figure 17-036. Right Rotor Yawing Moment Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

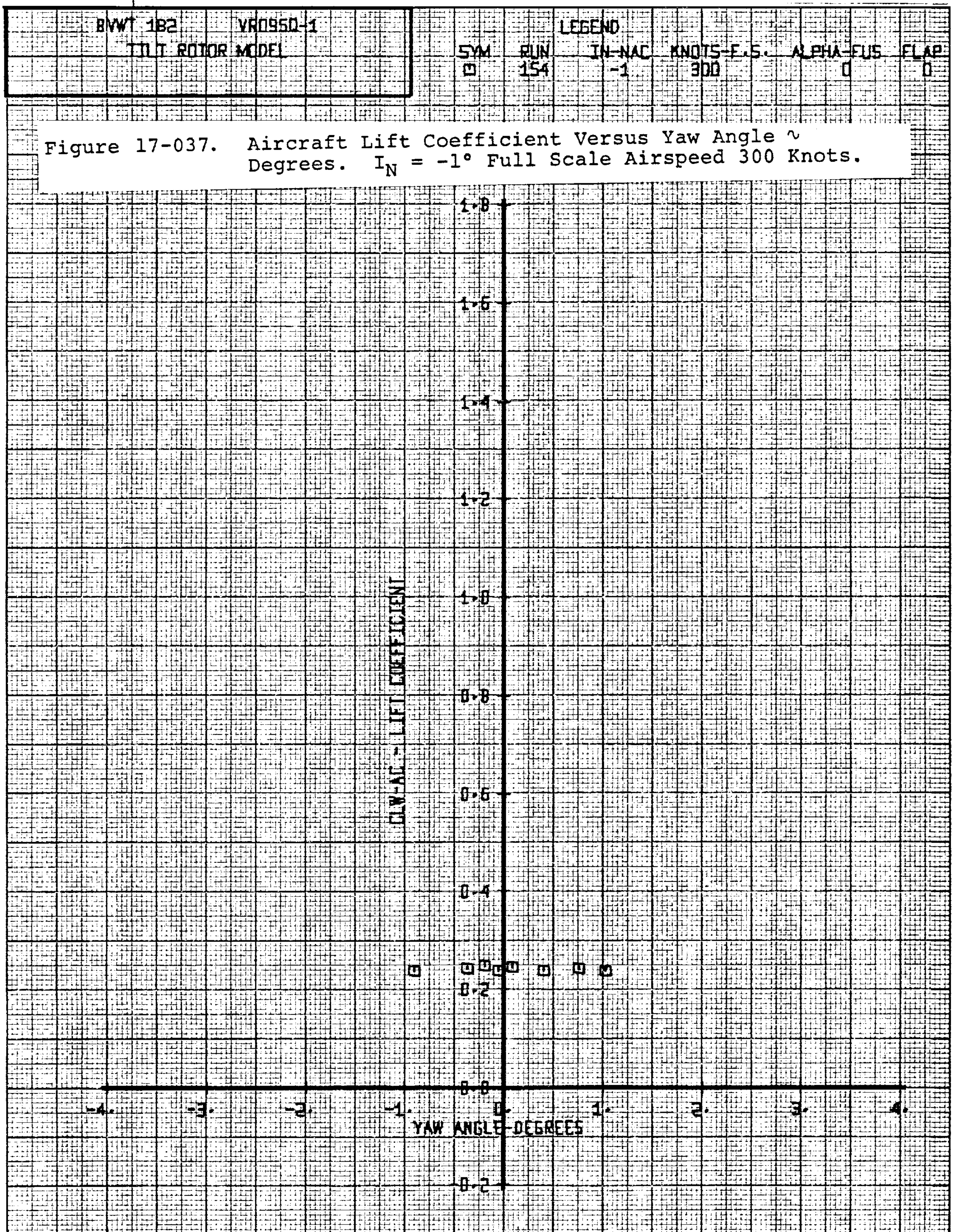


Figure 17-037. Aircraft Lift Coefficient Versus Yaw Angle ~ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

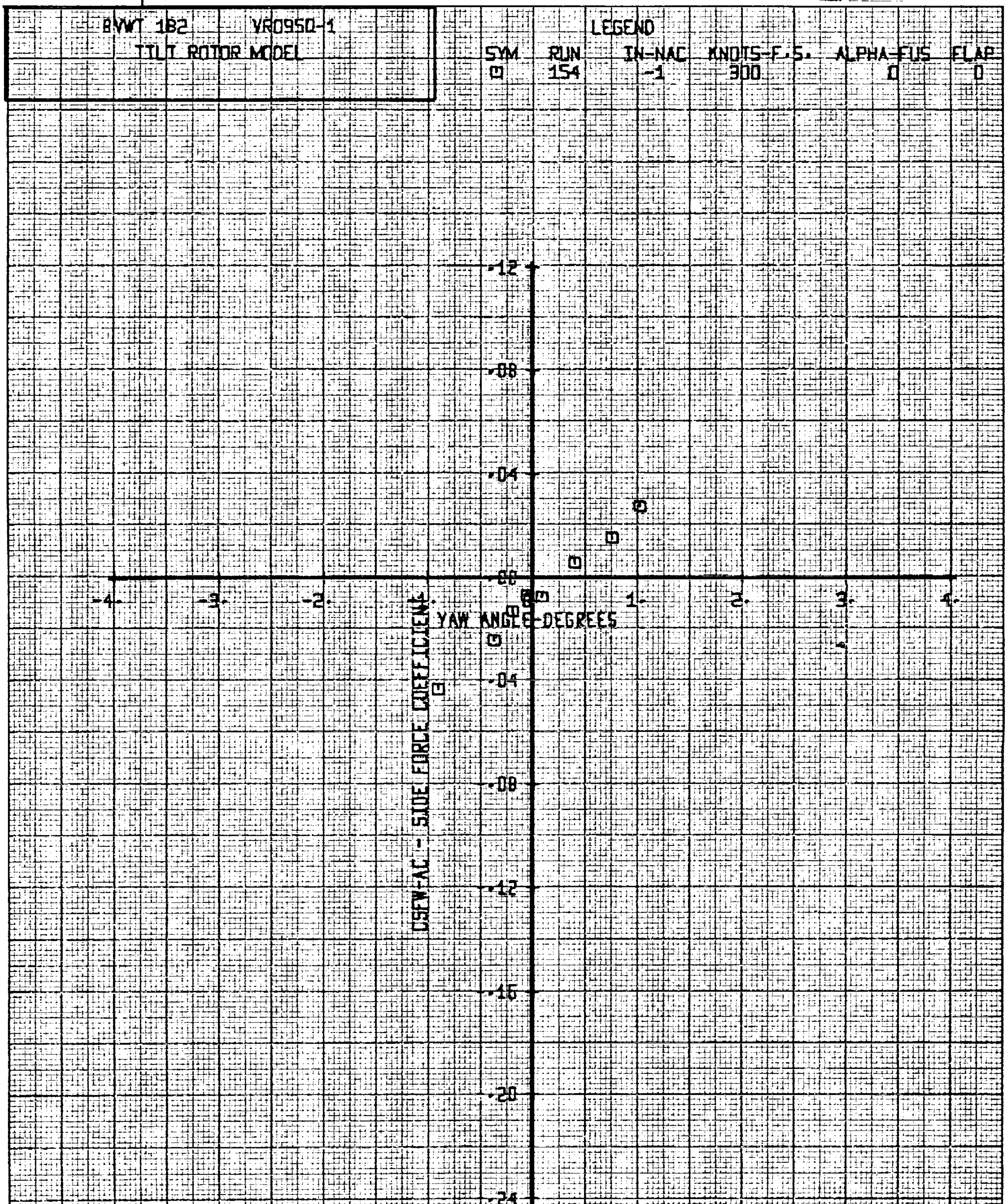


Figure 17-038. Aircraft Side Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

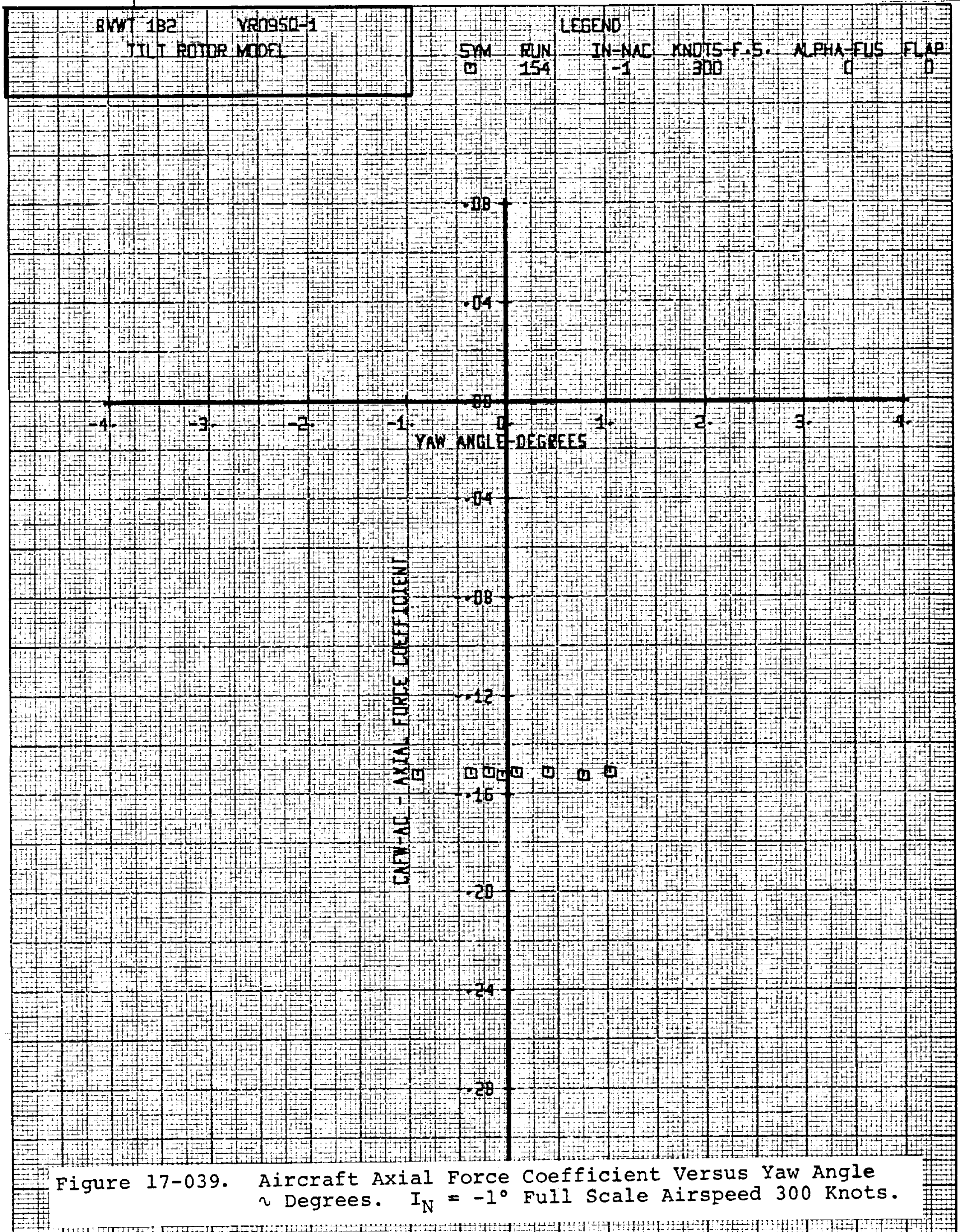


Figure 17-039. Aircraft Axial Force Coefficient Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

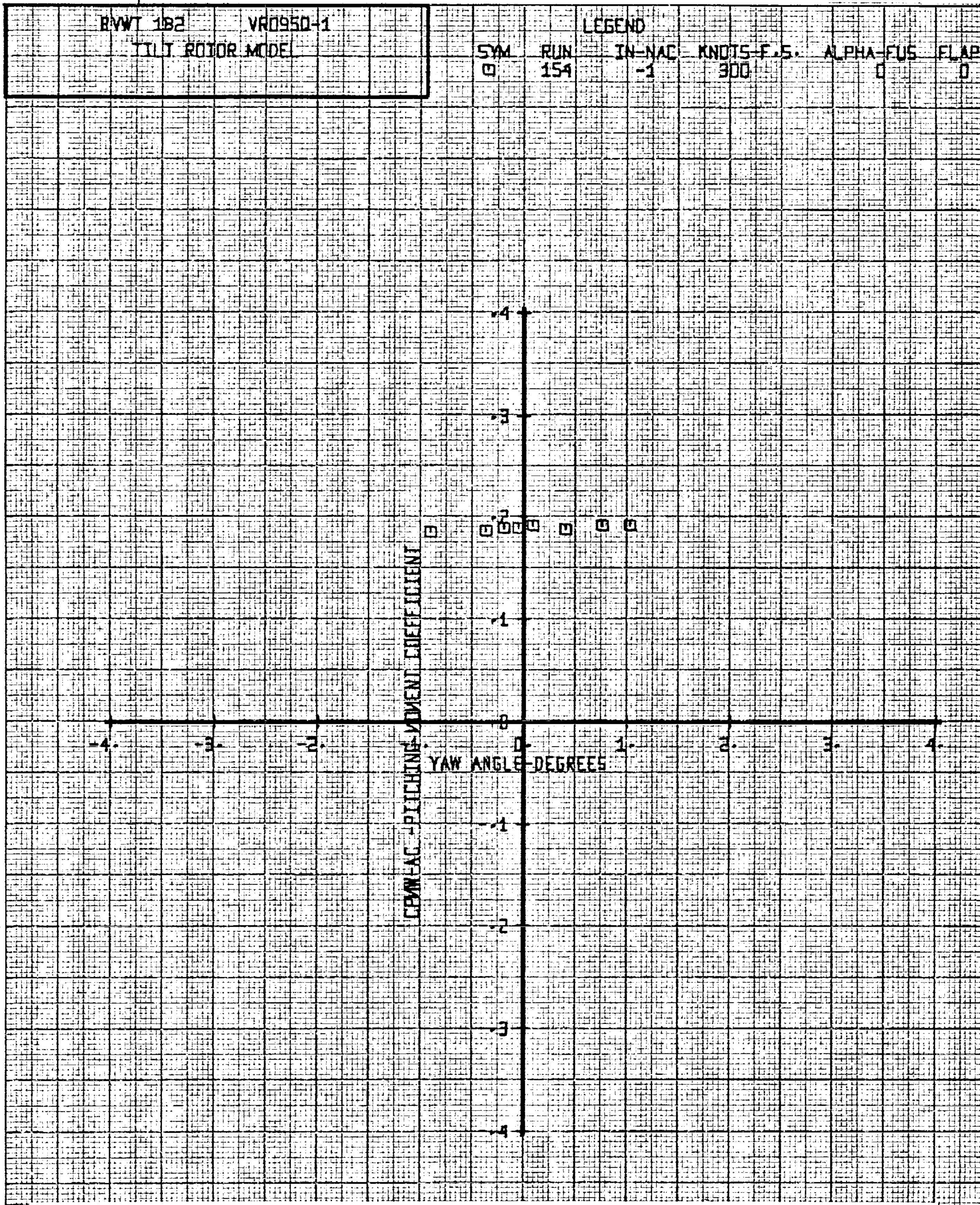


Figure 17-040. Aircraft Pitching Moment Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

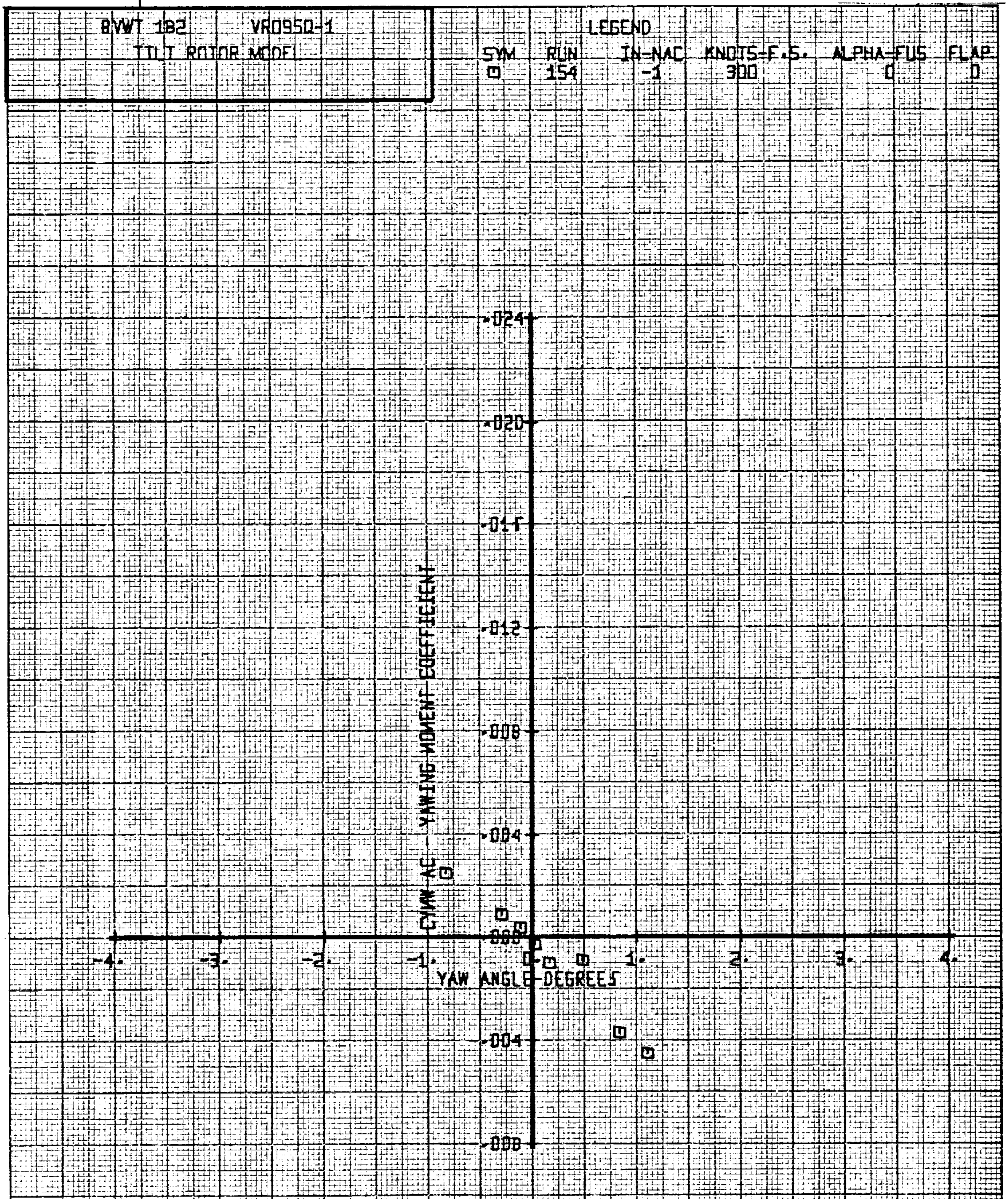


Figure 17-041. Aircraft Yawing Moment Versus Yaw Angle ∿ Degrees.
I_N = -1° Full Scale Airspeed 300 Knots.

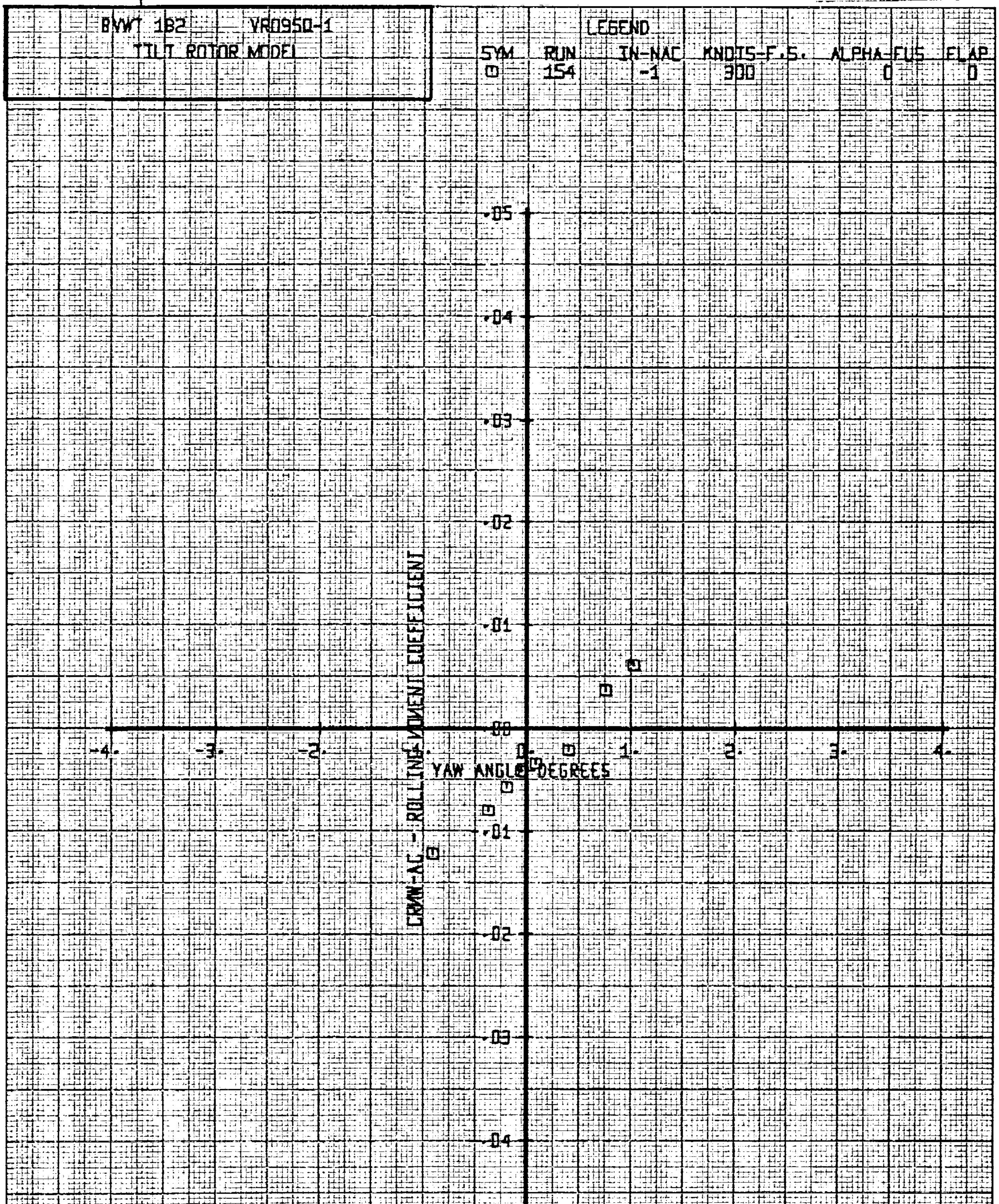


Figure 17-042. Aircraft Rolling Moment Versus Yaw Angle ∿ Degrees. I_N = -1° Full Scale Airspeed 300 Knots.

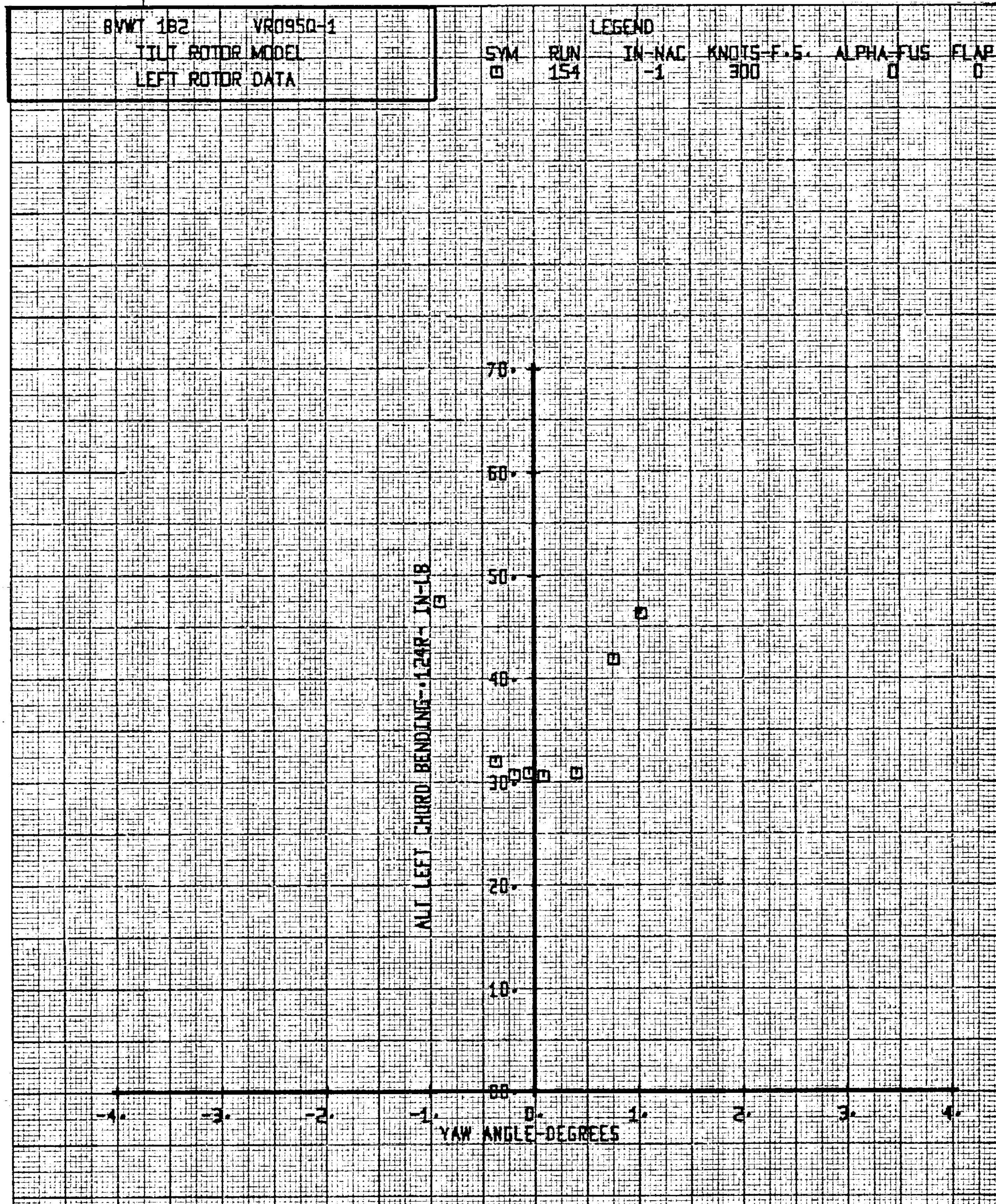


Figure 17-043. Alt. Left Chord Bending Versus Yaw Angle ∿ Degrees. I_N = -1° Full Scale Airspeed 300 Knots.

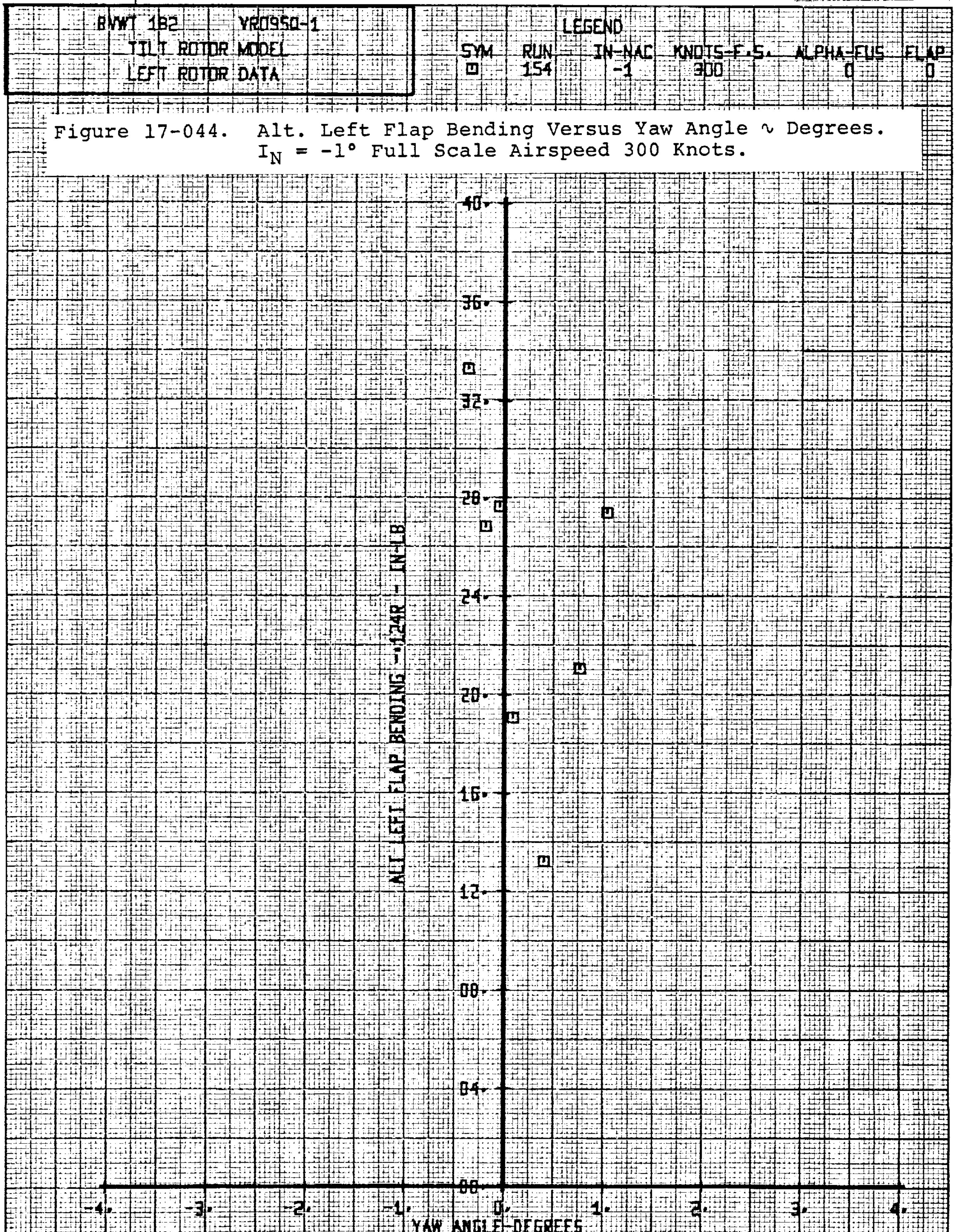


Figure 17-044. Alt. Left Flap Bending Versus Yaw Angle ∿ Degrees. I_N = -1° Full Scale Airspeed 300 Knots.

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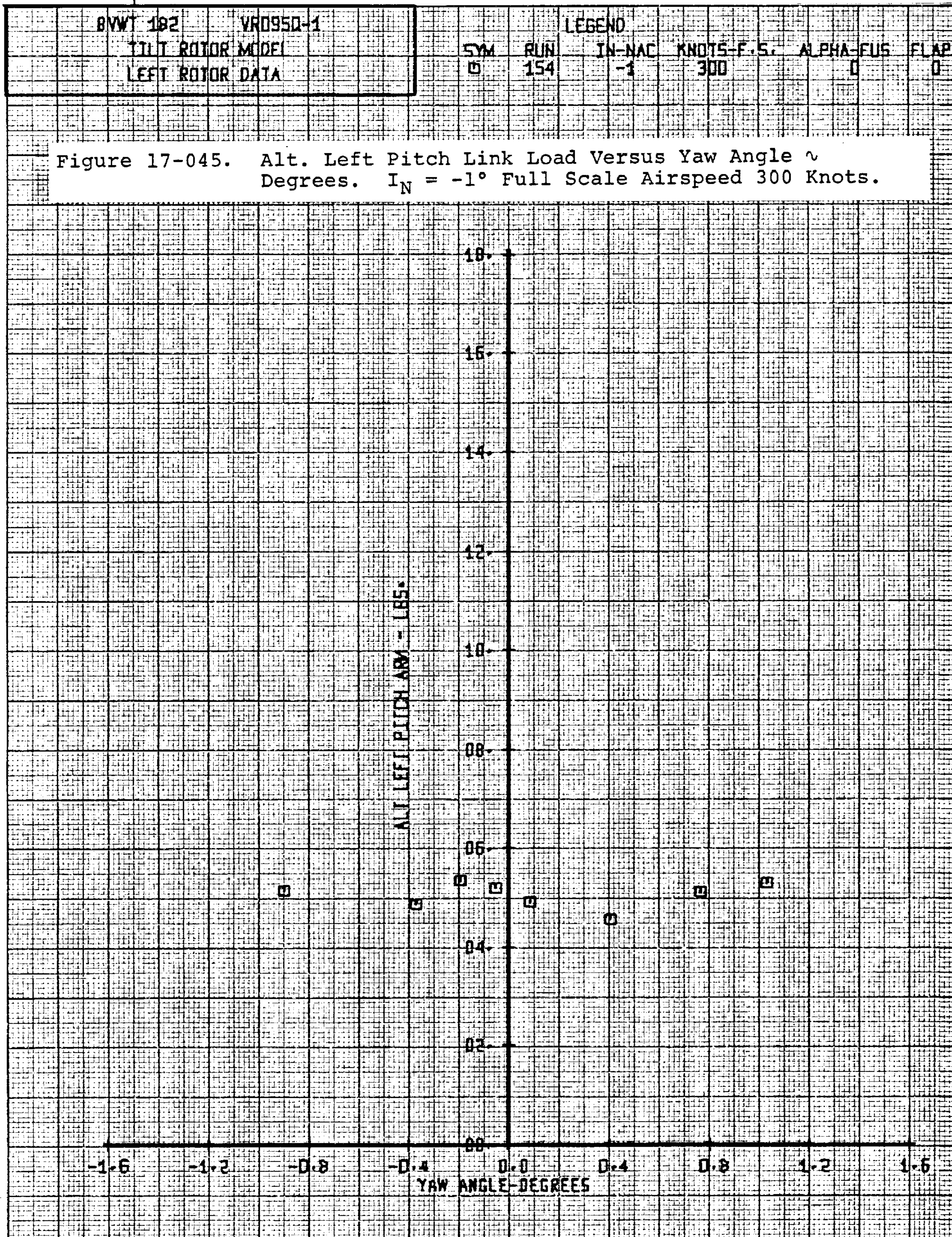
Figure 17-045. Alt. Left Pitch Link Load Versus Yaw Angle ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.



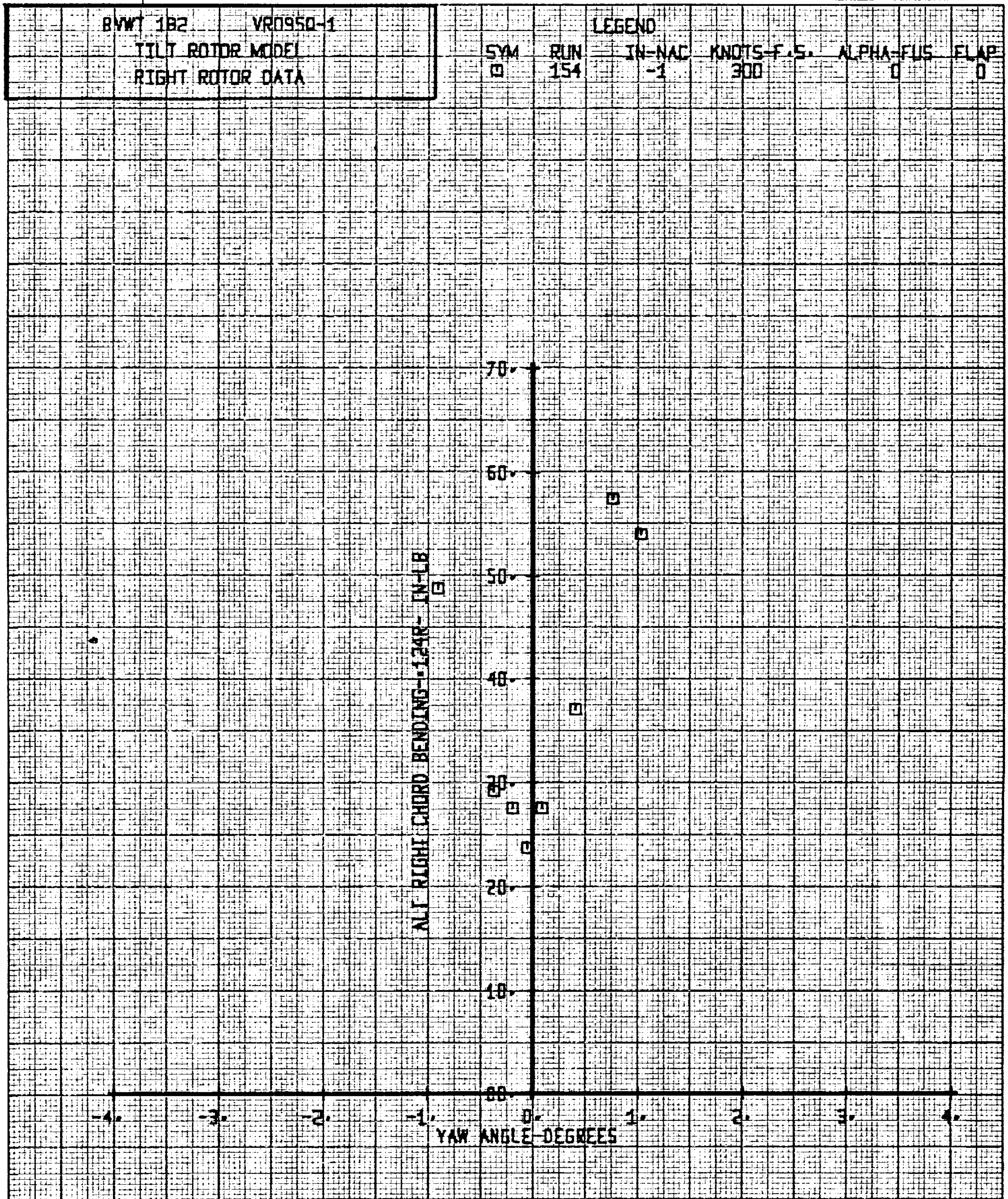


Figure 17-046. Alt. Right Chord Bending Versus Yaw Angle ∿ Degrees. I_N = -1° Full Scale Airspeed 300 Knots.

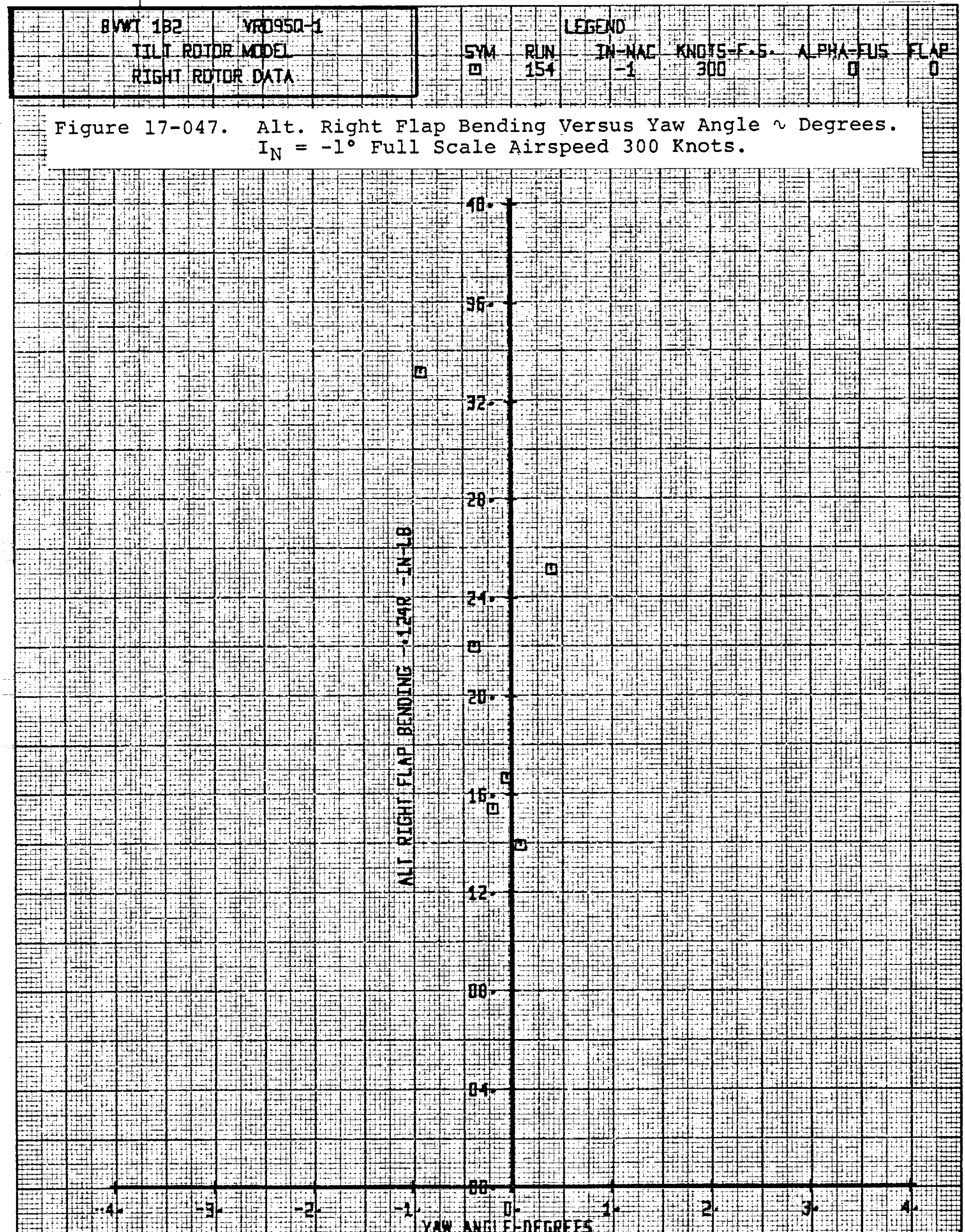


Figure 17-047. Alt. Right Flap Bending Versus Yaw Angle ∿ Degrees. I_N = -1° Full Scale Airspeed 300 Knots.

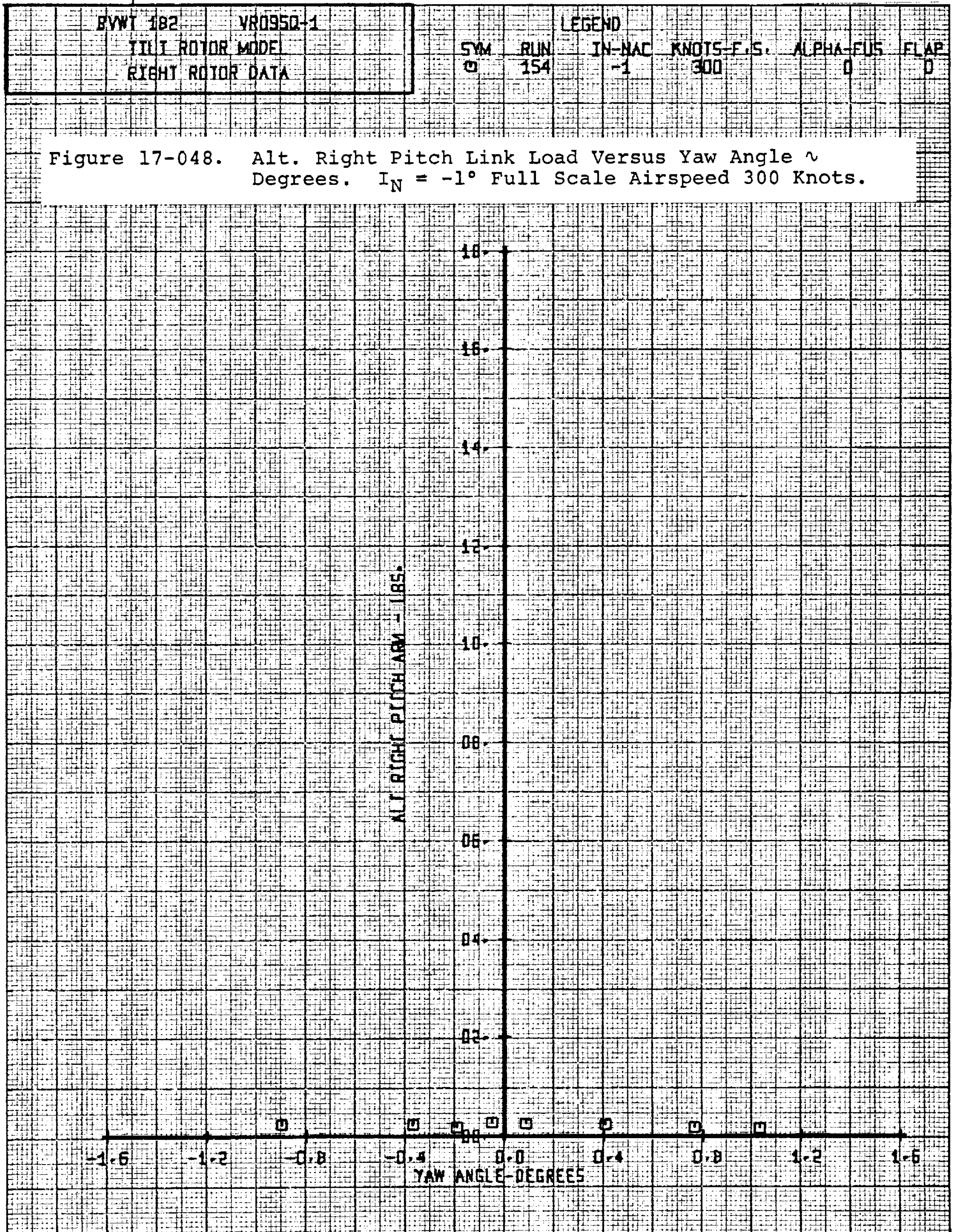


Figure 17-048. Alt. Right Pitch Link Load Versus Yaw Angle ~ Degrees. I_N = -1° Full Scale Airspeed 300 Knots.

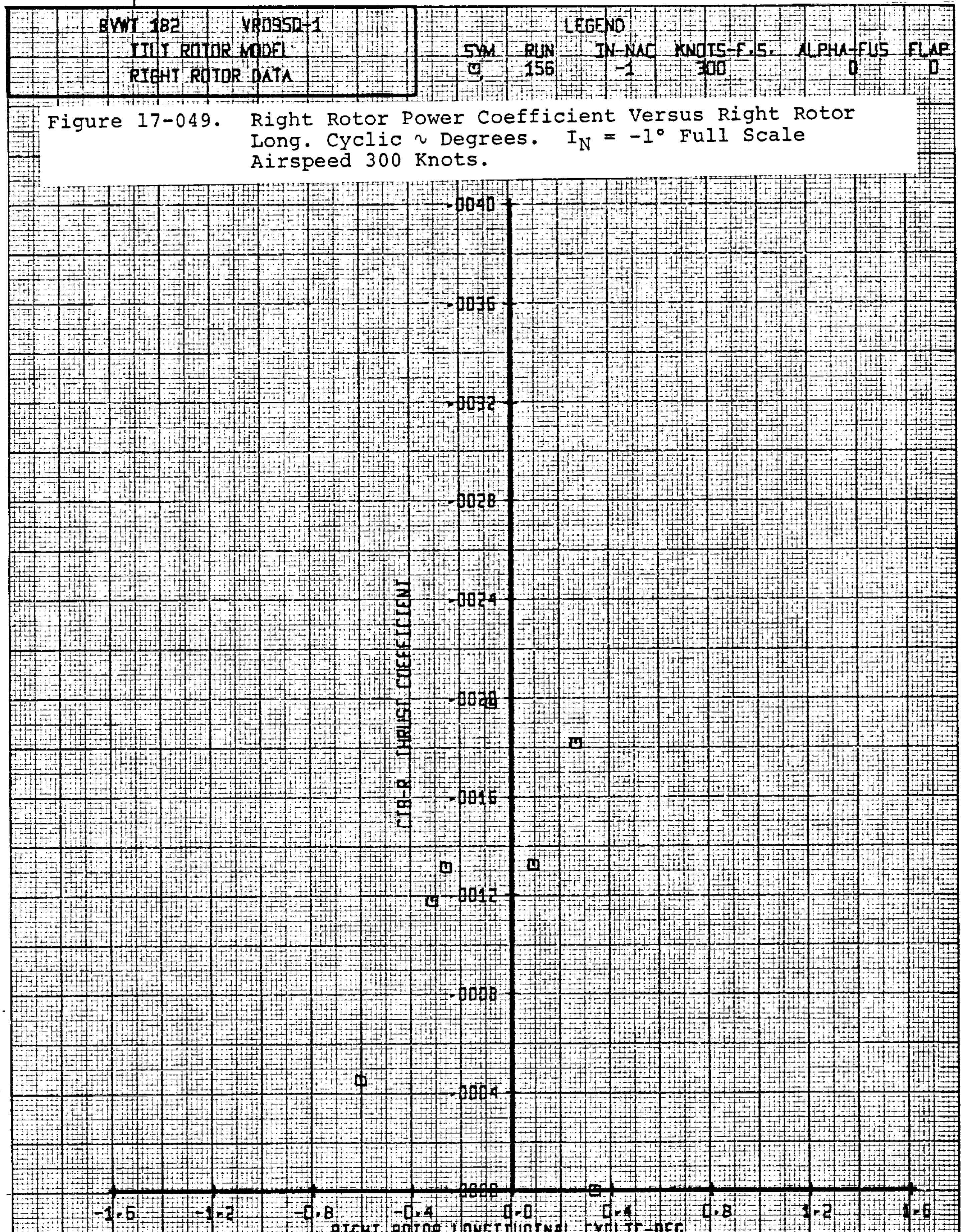


Figure 17-049. Right Rotor Power Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

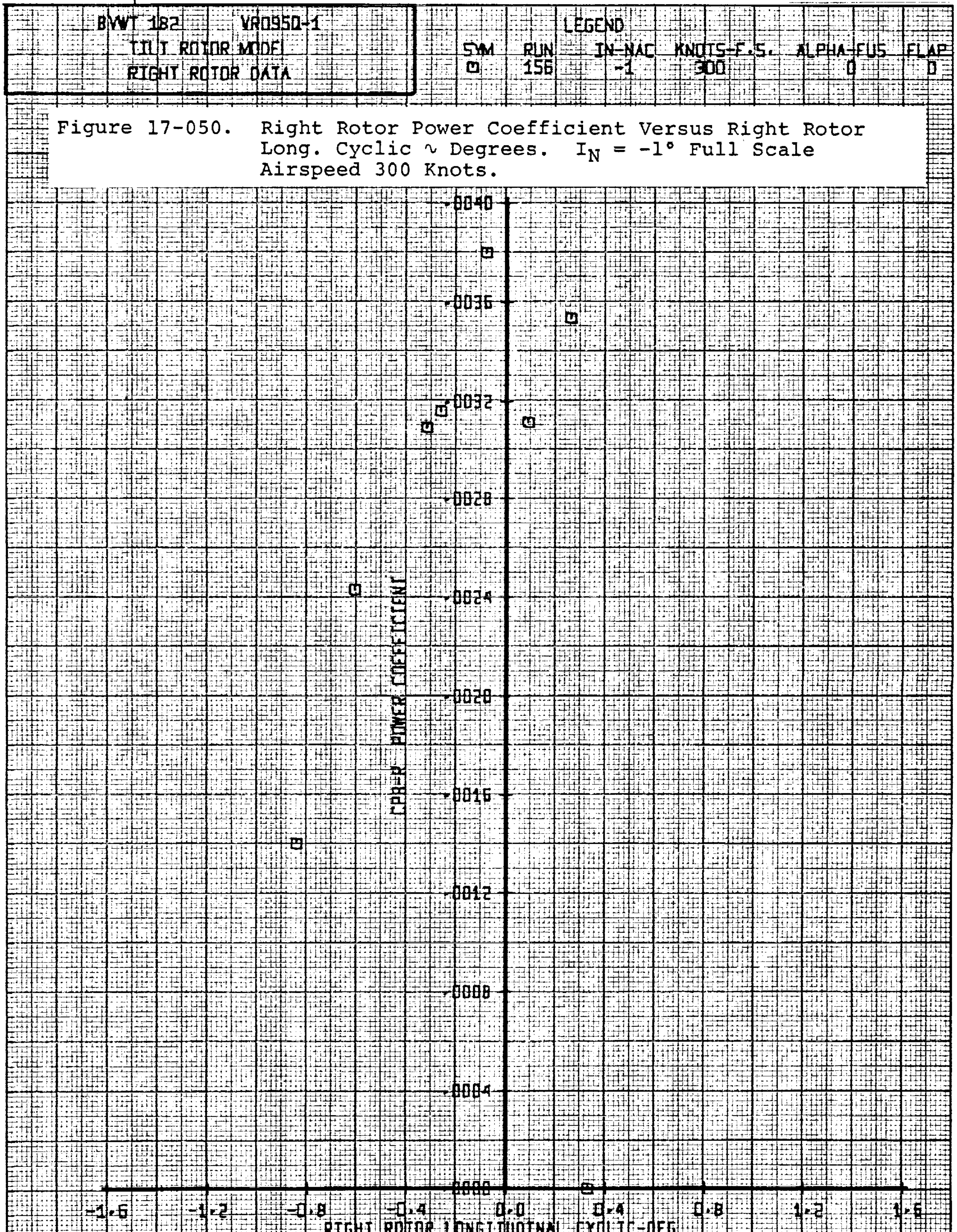


Figure 17-050. Right Rotor Power Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

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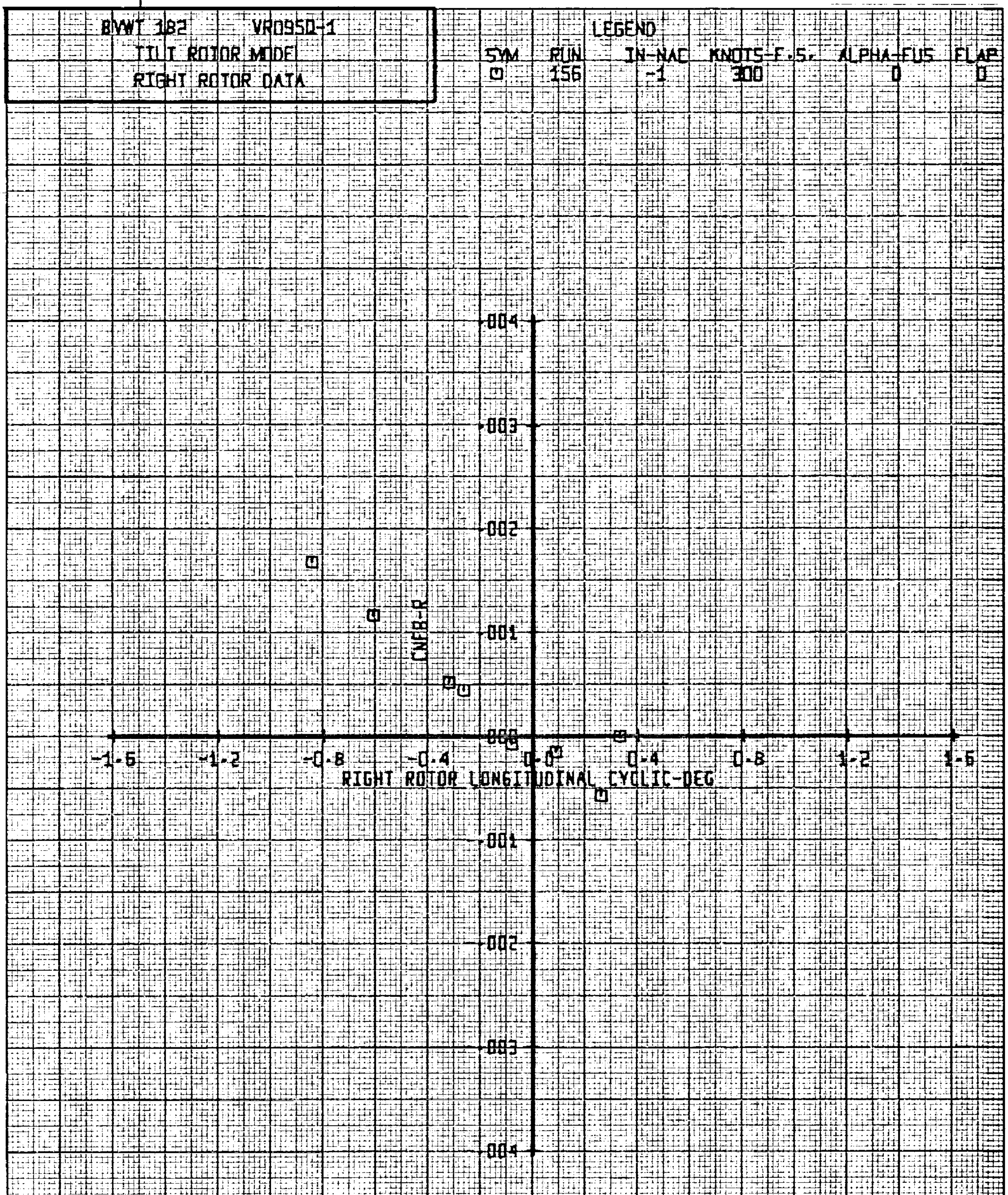

Figure 17-051. Right Rotor Normal Force Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

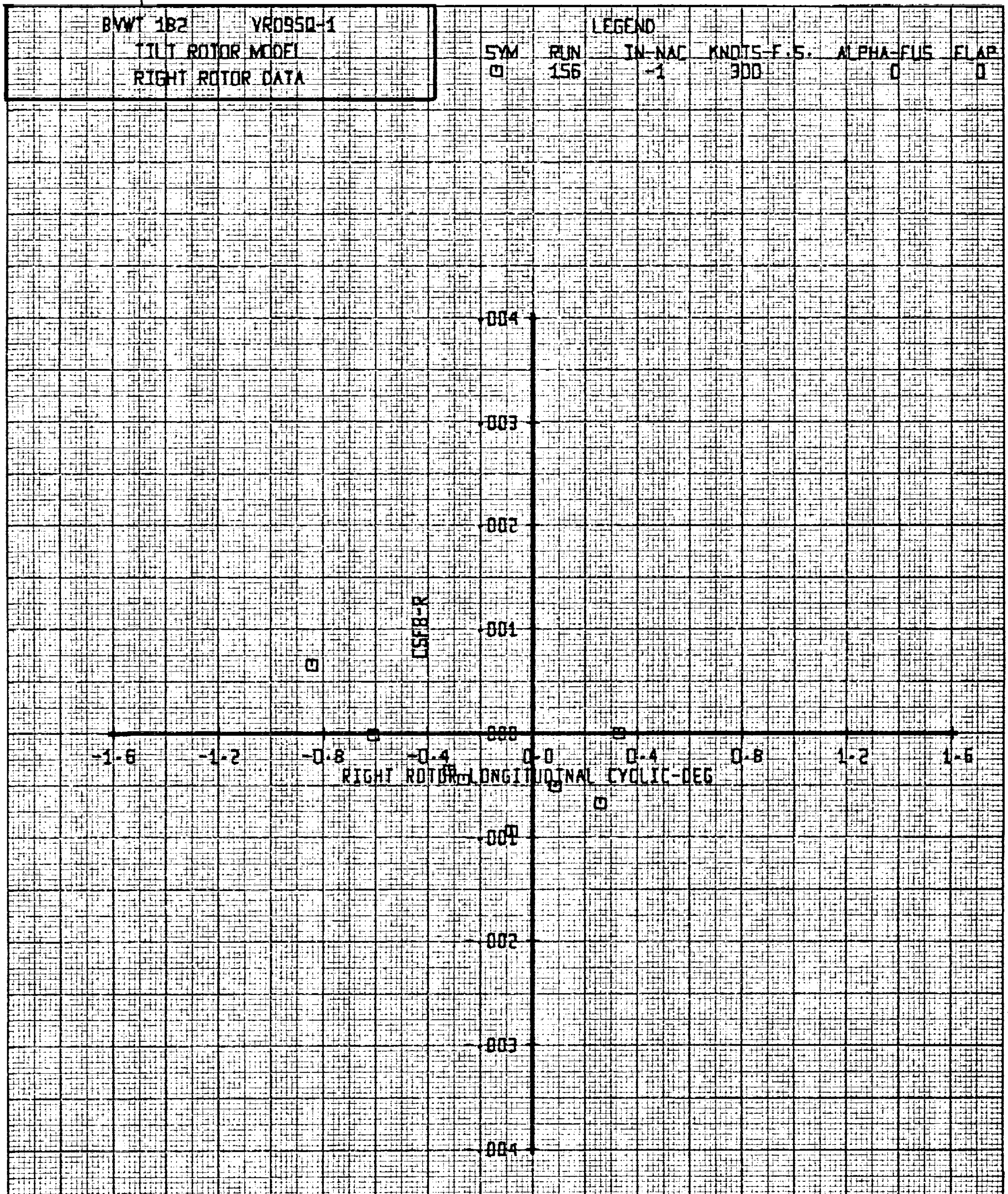

Figure 17-052. Right Rotor Side Force Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

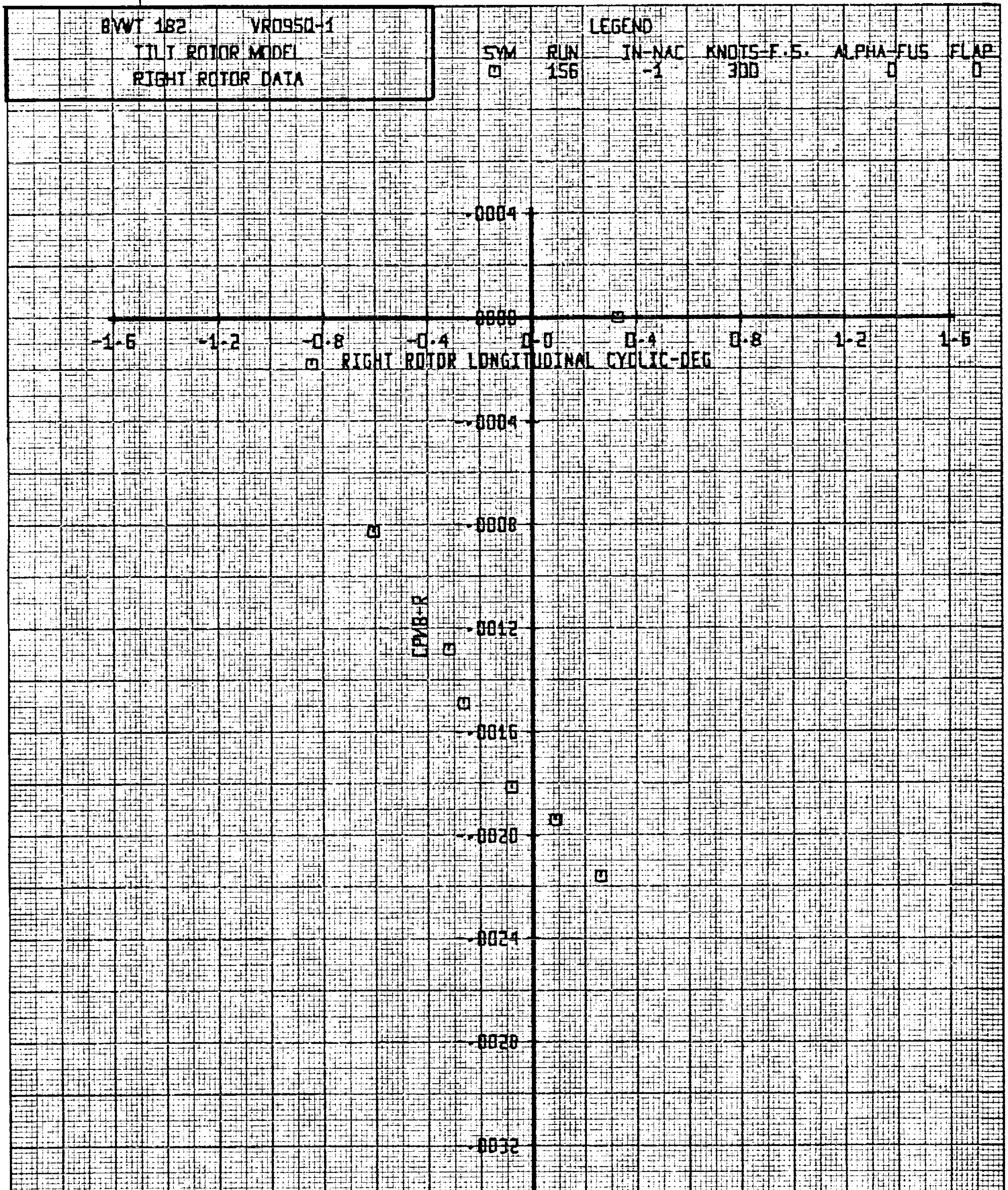

Figure 17-053. Right Rotor Pitching Moment Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

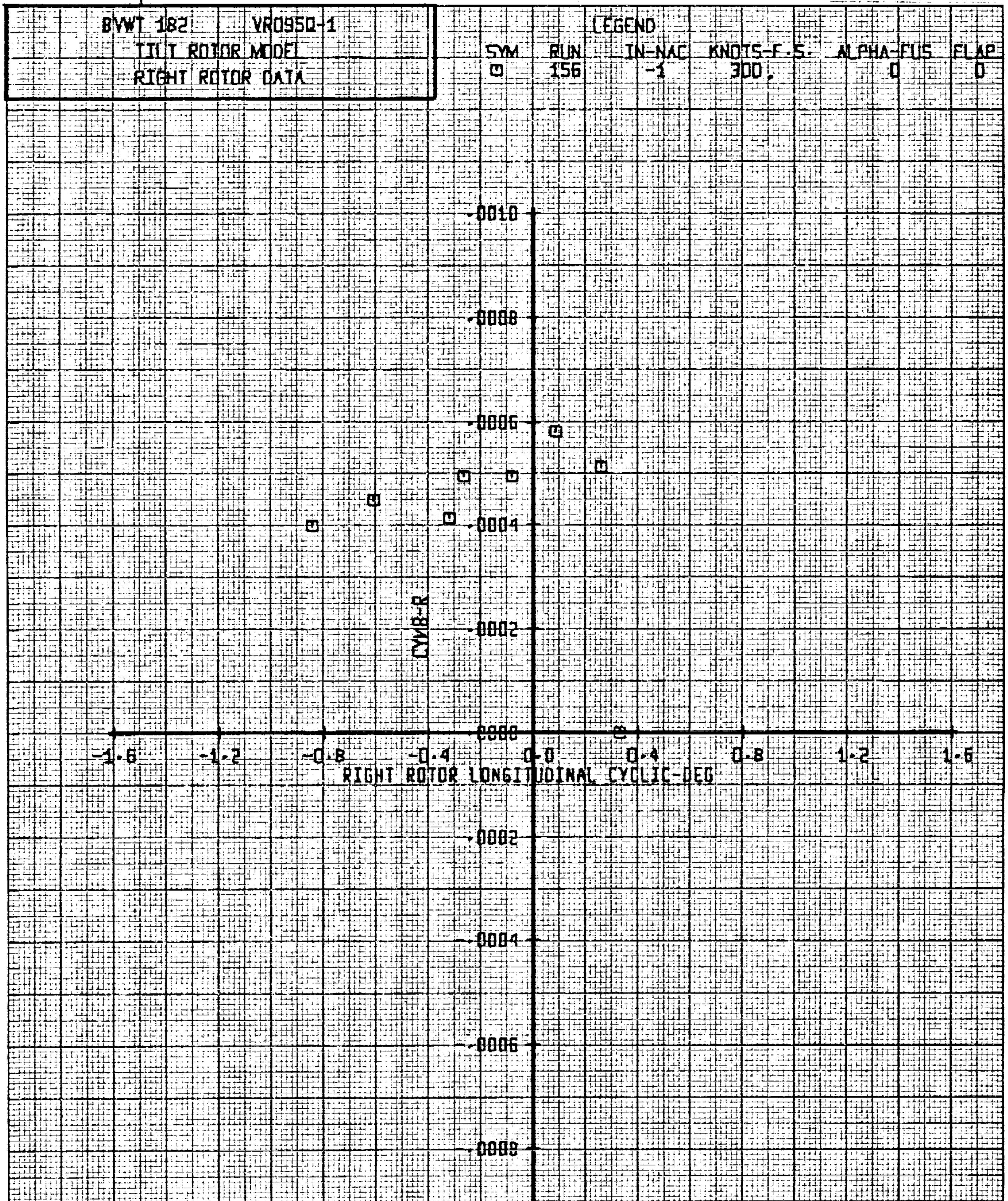

Figure 17-054. Right Rotor Yawing Moment Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

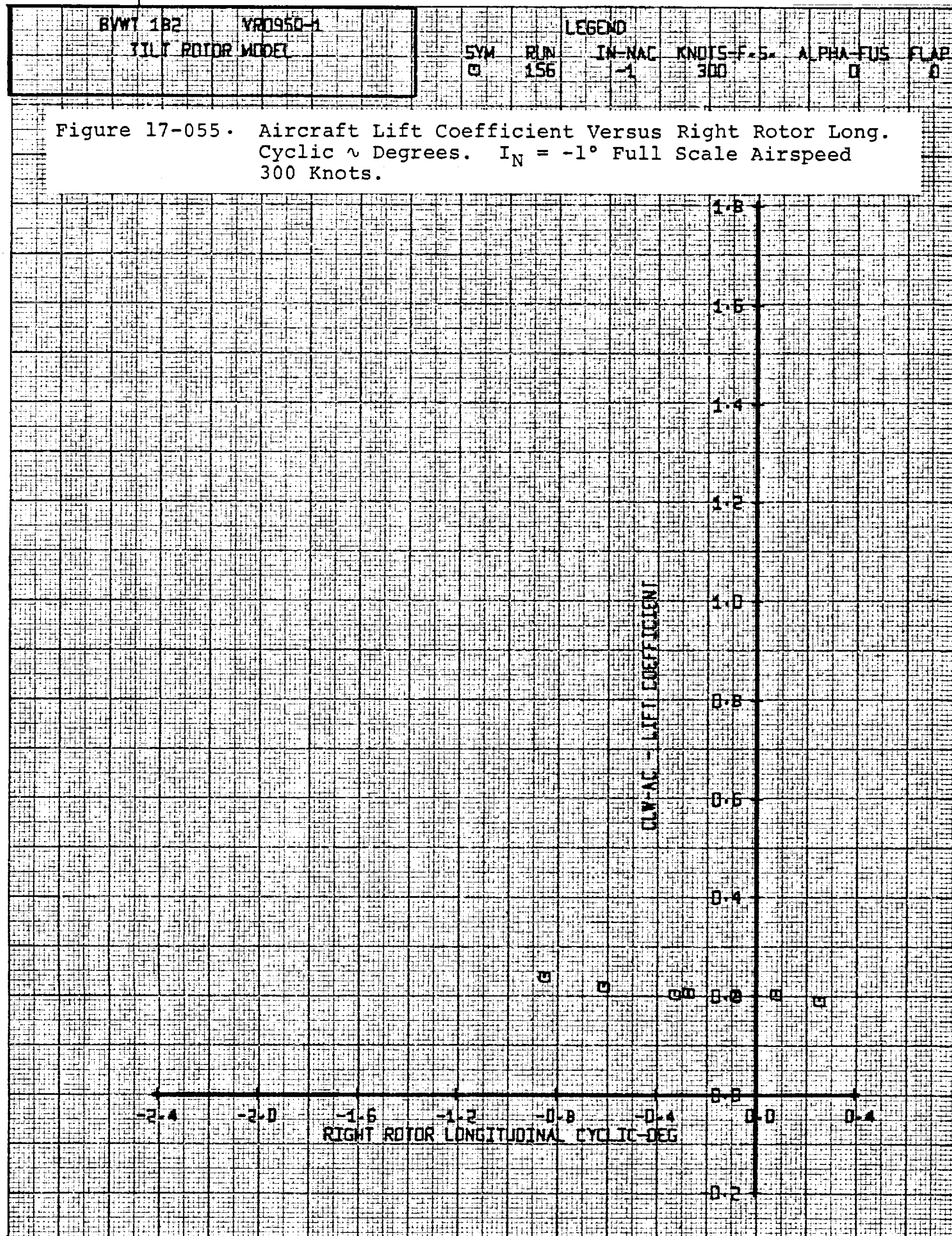

Figure 17-055. Aircraft Lift Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

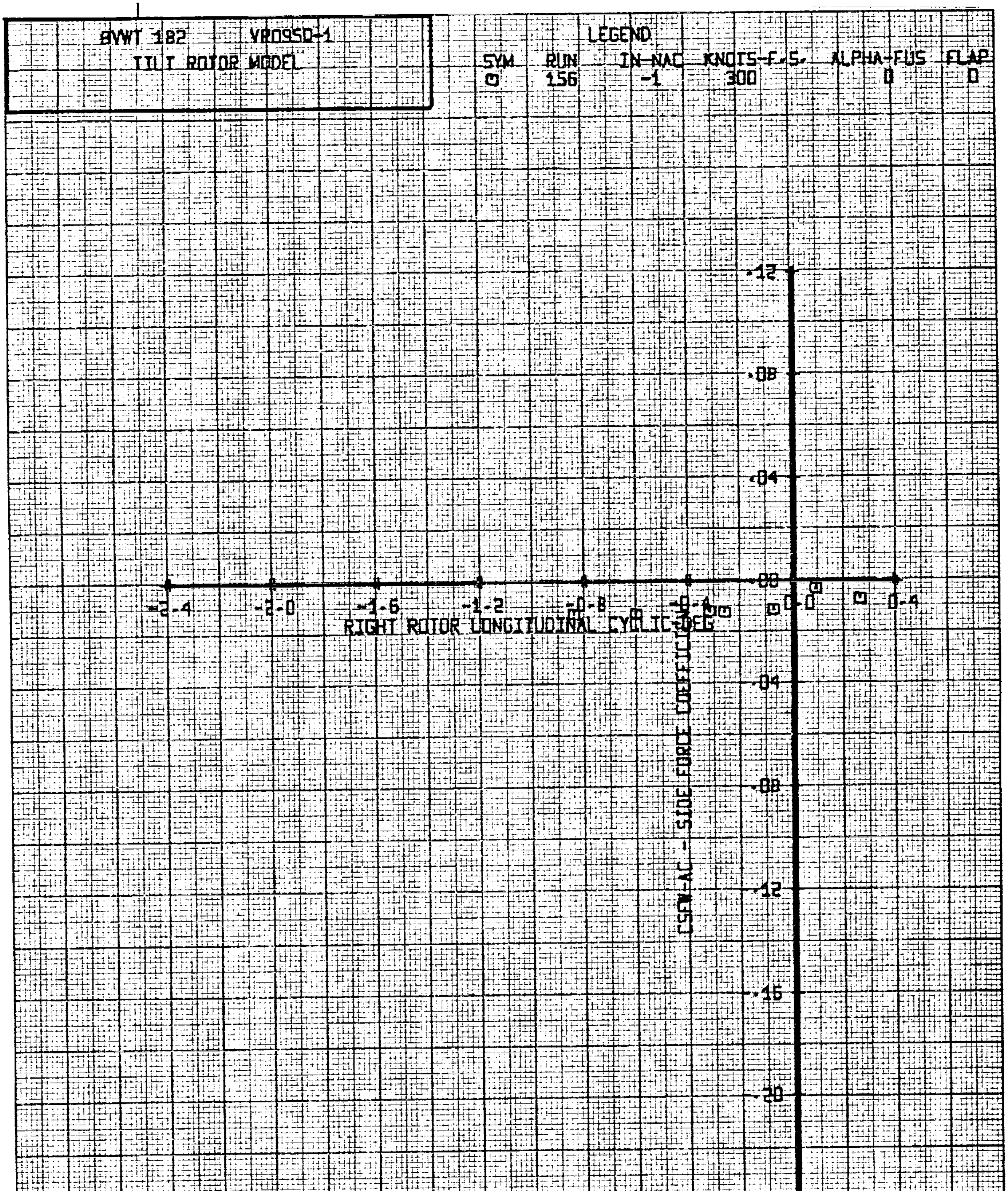

Figure 17-056. Aircraft Side Force Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

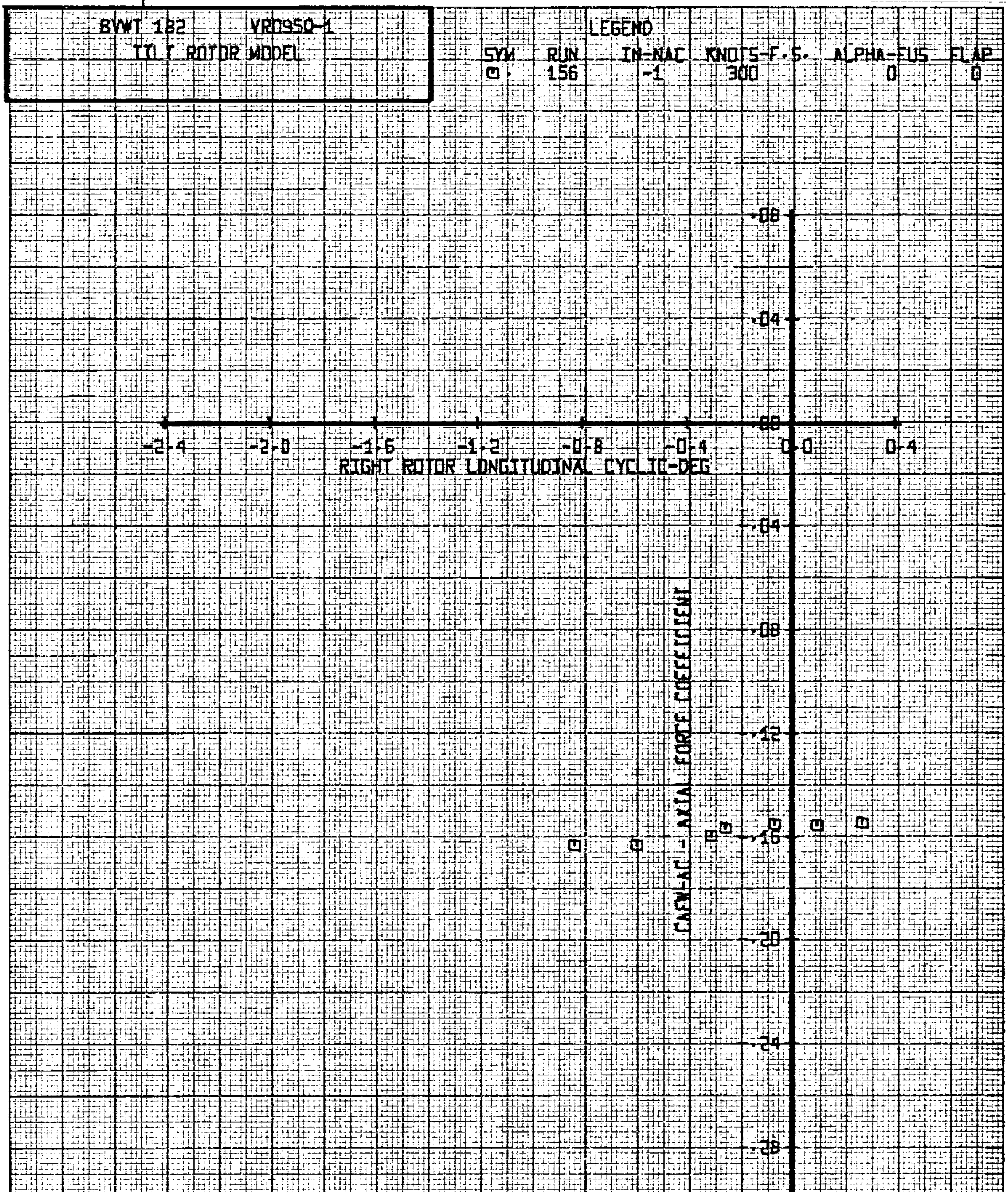

Figure 17-057. Aircraft Axial Force Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

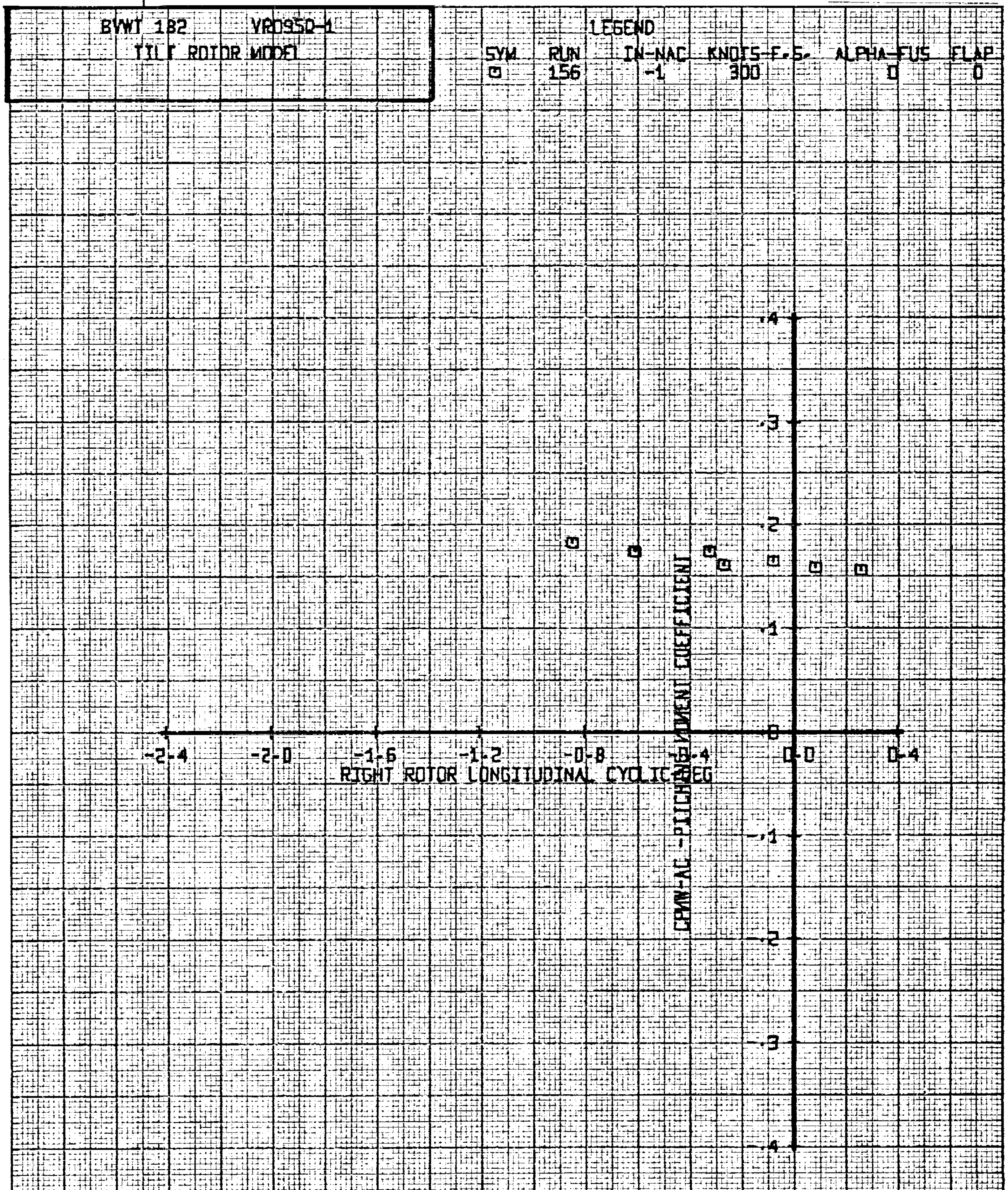

Figure 17-058. Aircraft Pitching Moment Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

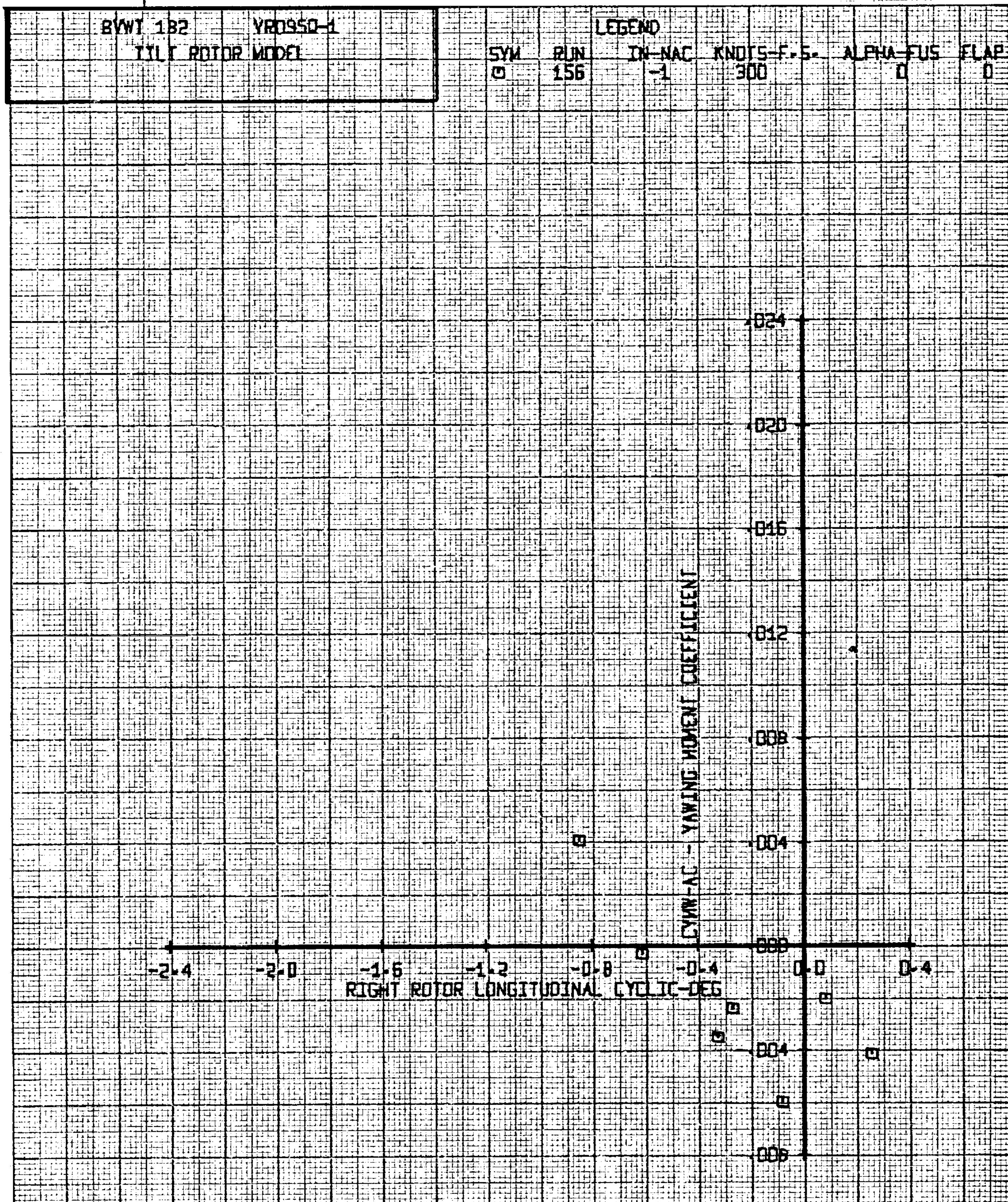

Figure 17-059. Aircraft Yawing Moment Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

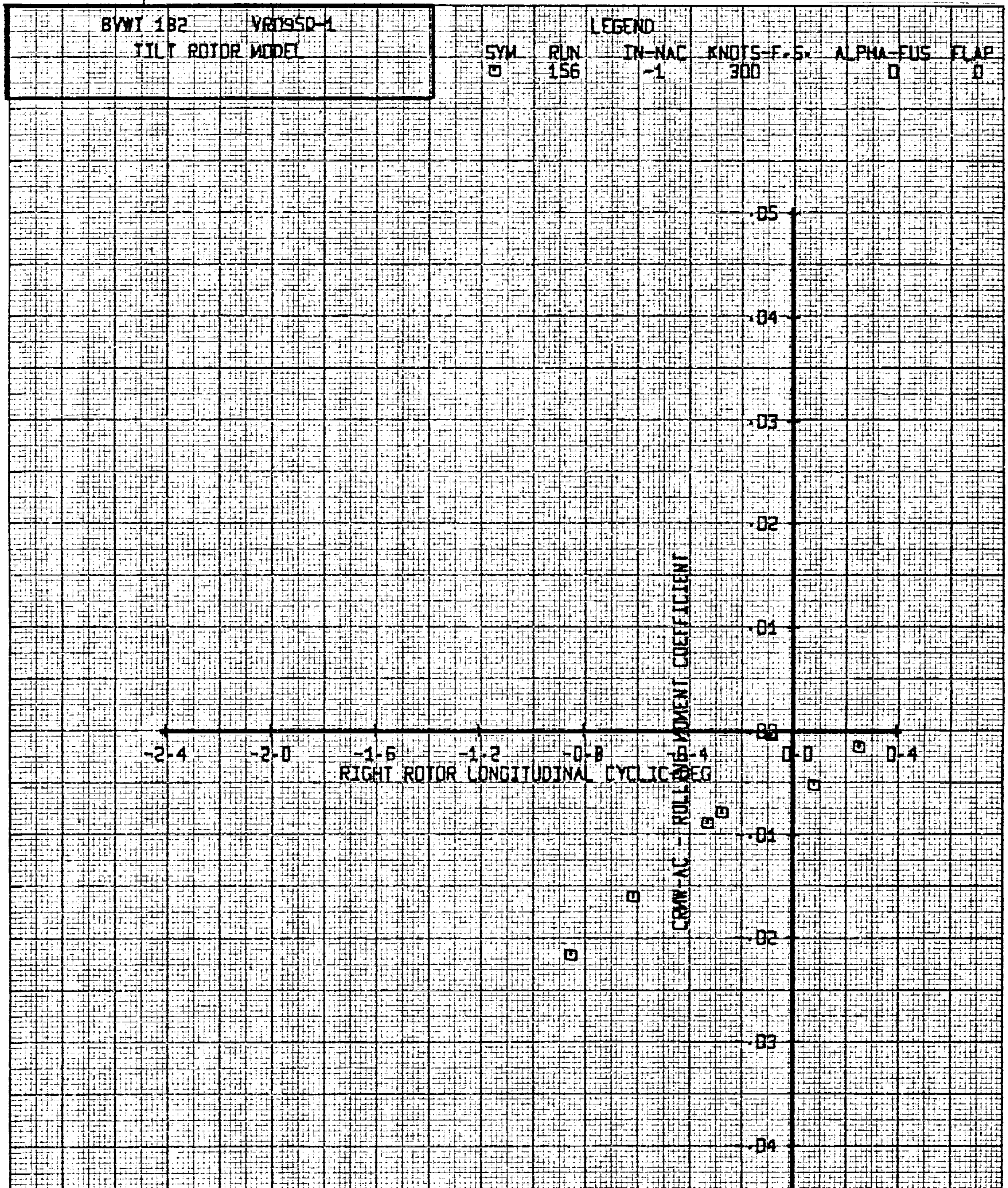

Figure 17-060. Aircraft Rolling Moment Coefficient Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

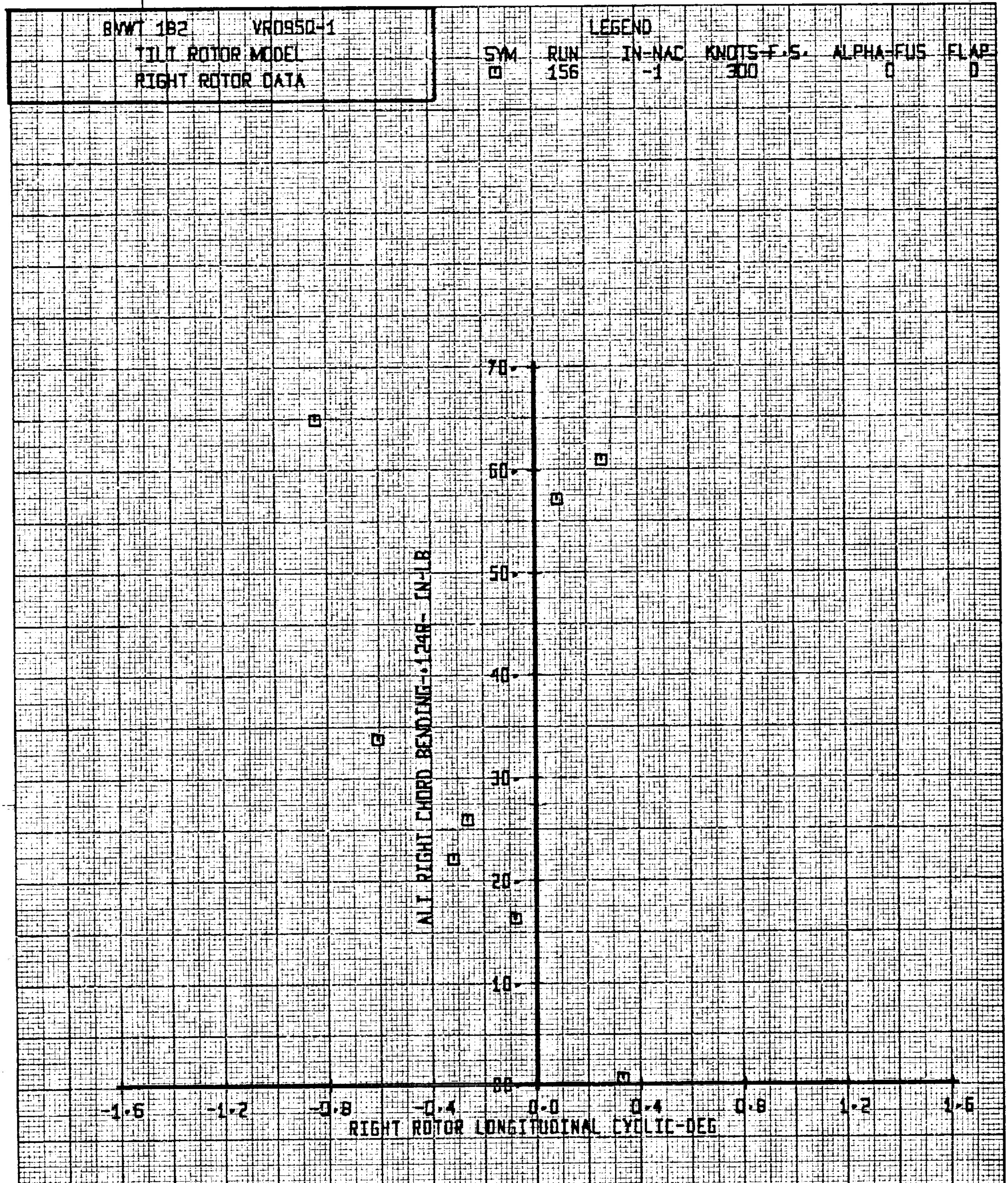

Figure 17-061. Alt. Right Chord Bending Versus Right Rotor Long. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

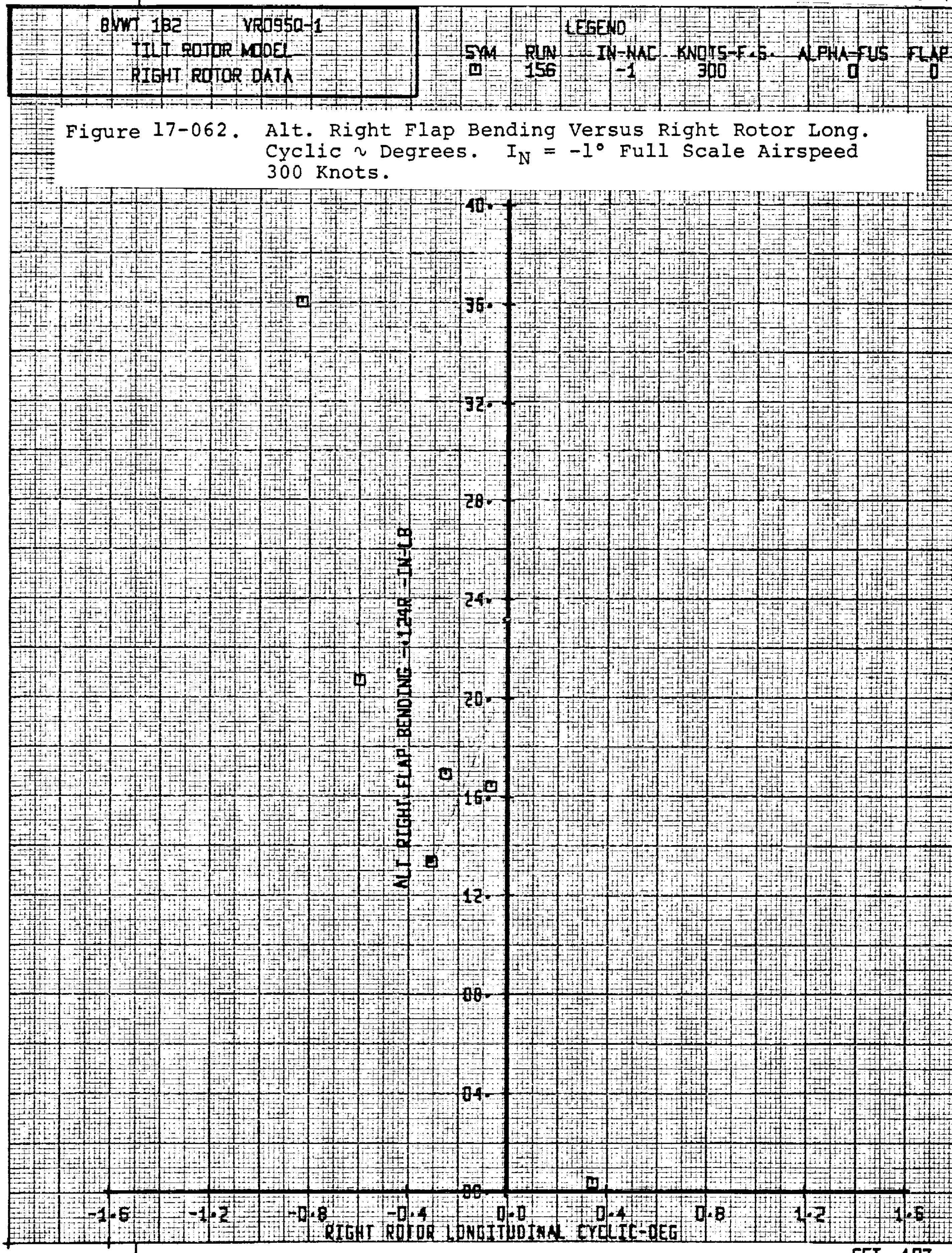

Figure 17-062. Alt. Right Flap Bending Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 300 Knots.

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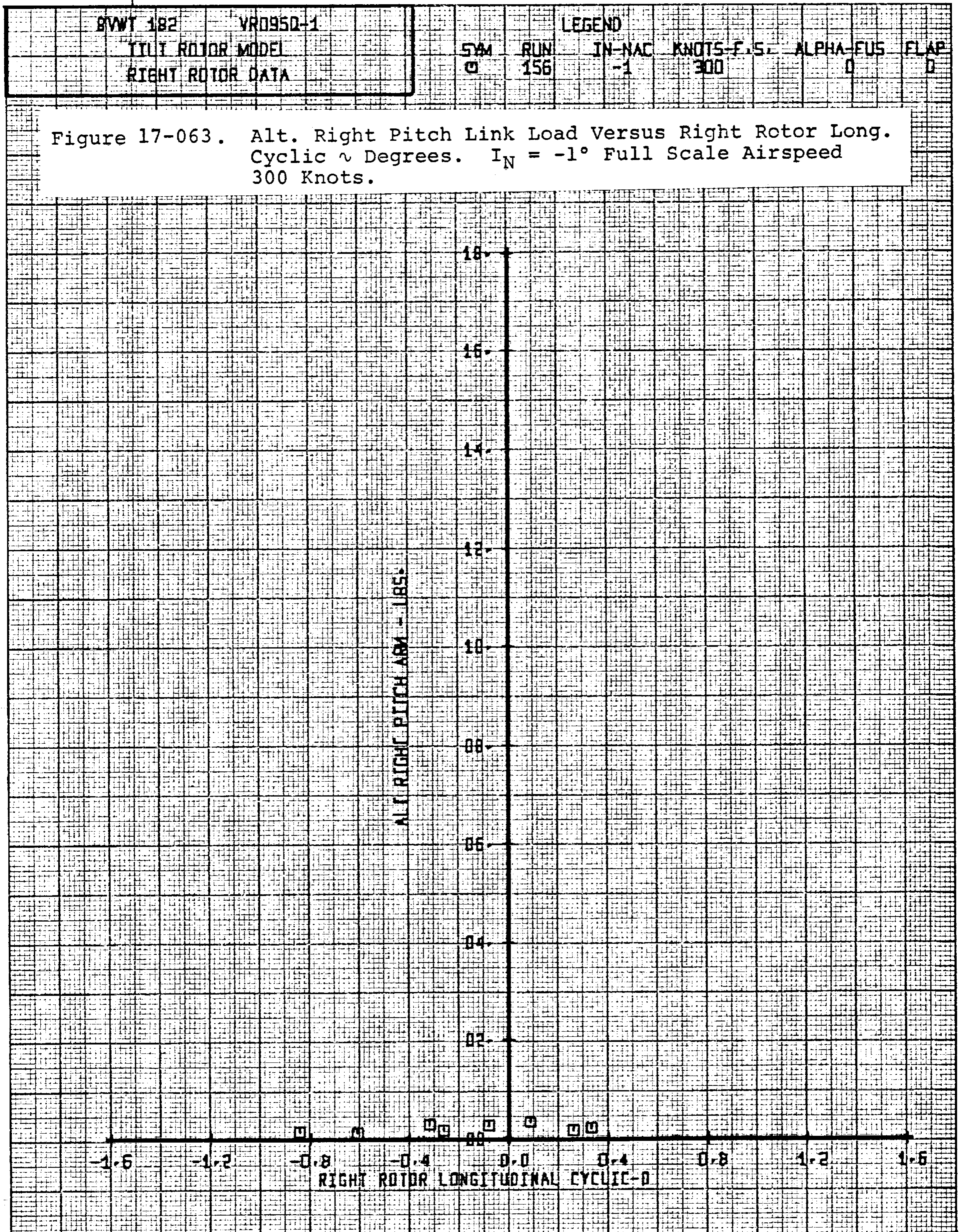


Figure 17-063. Alt. Right Pitch Link Load Versus Right Rotor Long. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 300 Knots.

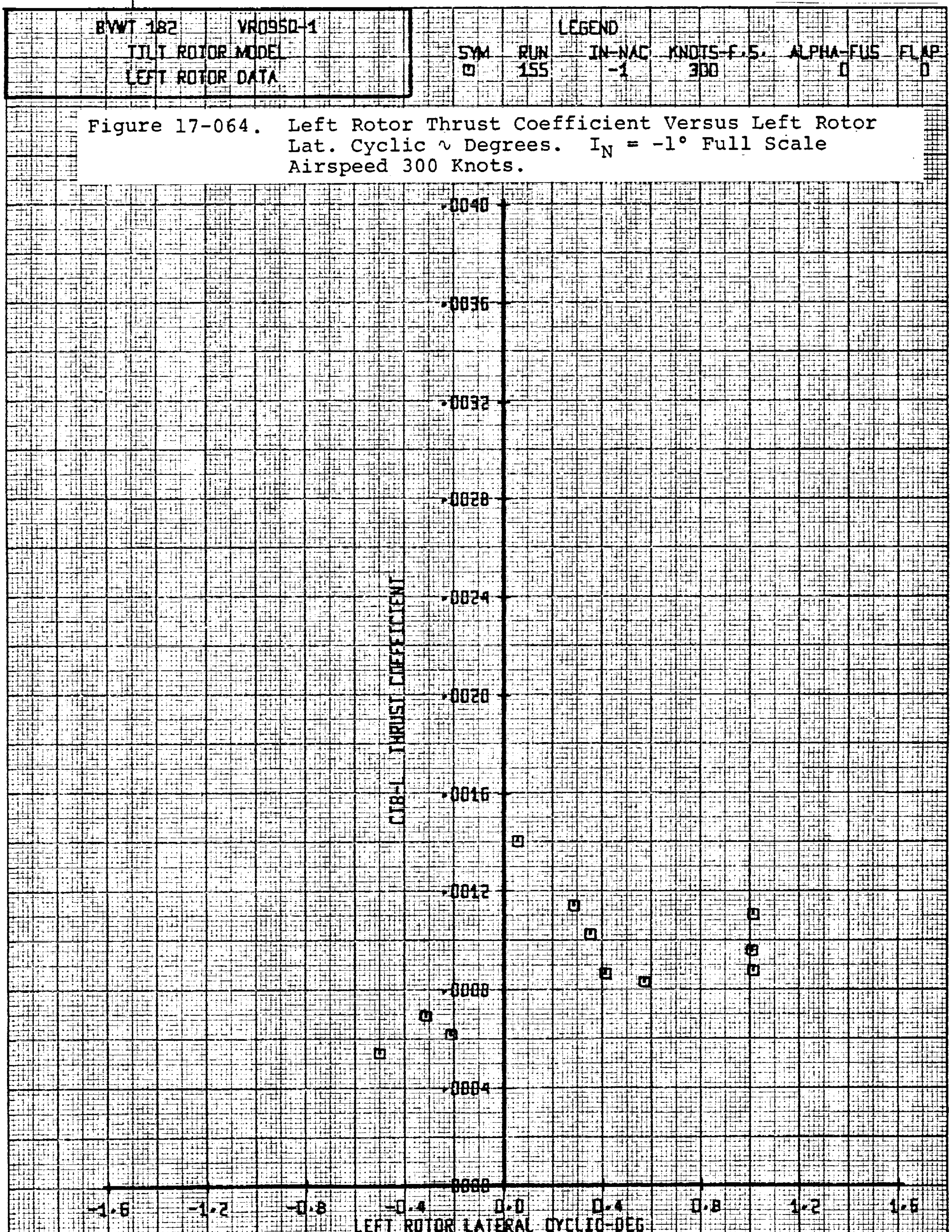


Figure 17-064. Left Rotor Thrust Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

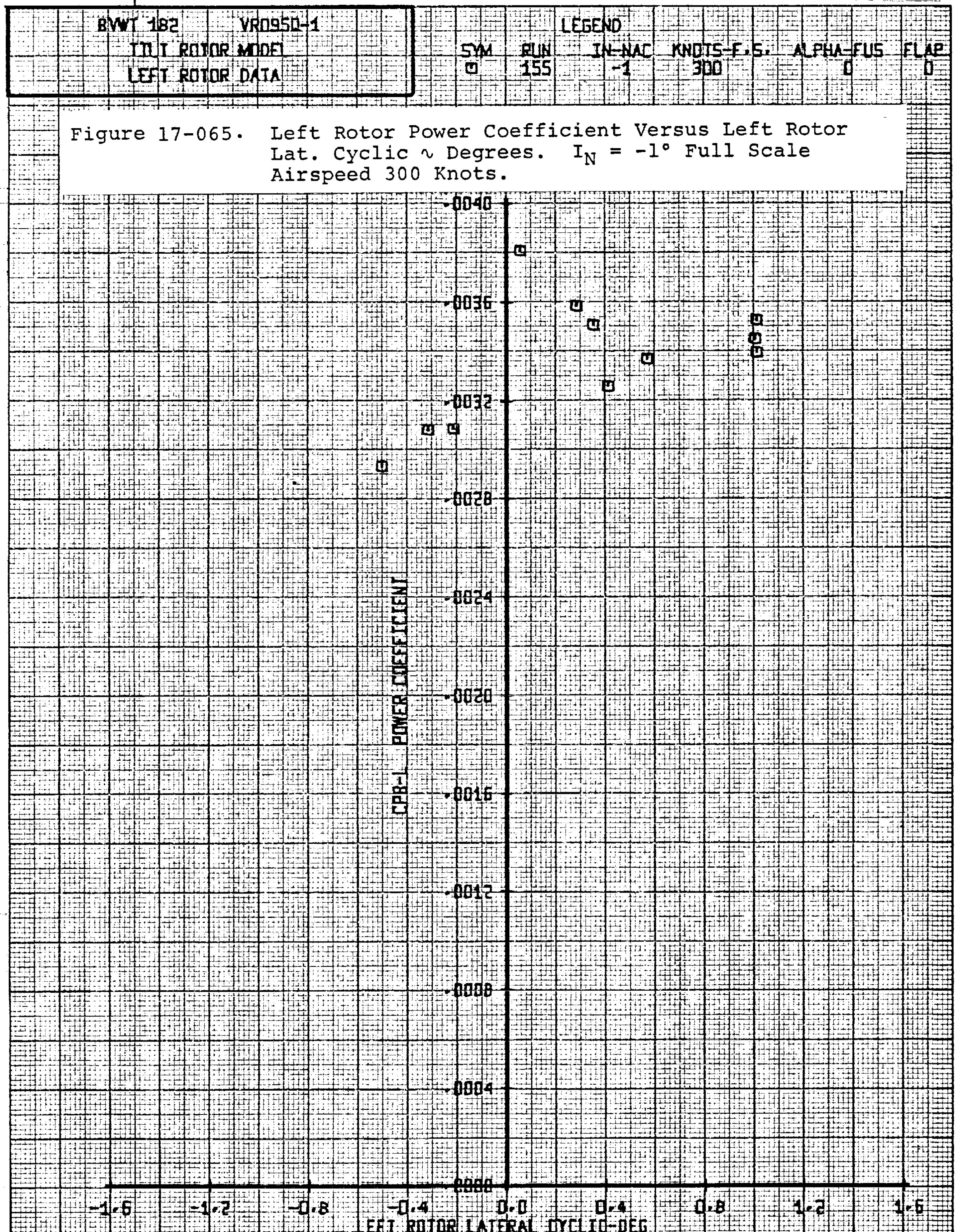


Figure 17-065. Left Rotor Power Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 300 Knots.

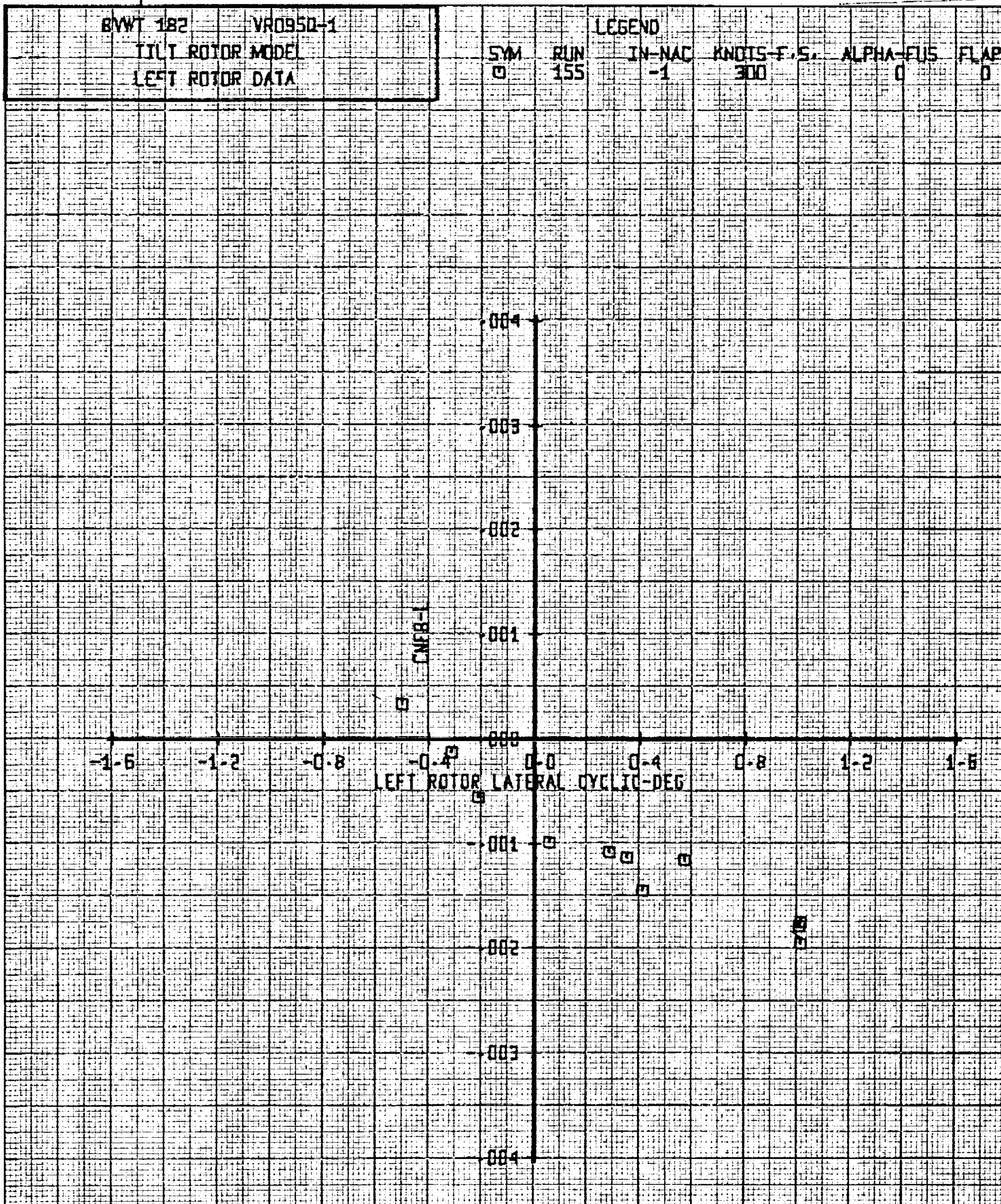


Figure 17-066. Left Rotor Normal Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 300 Knots.

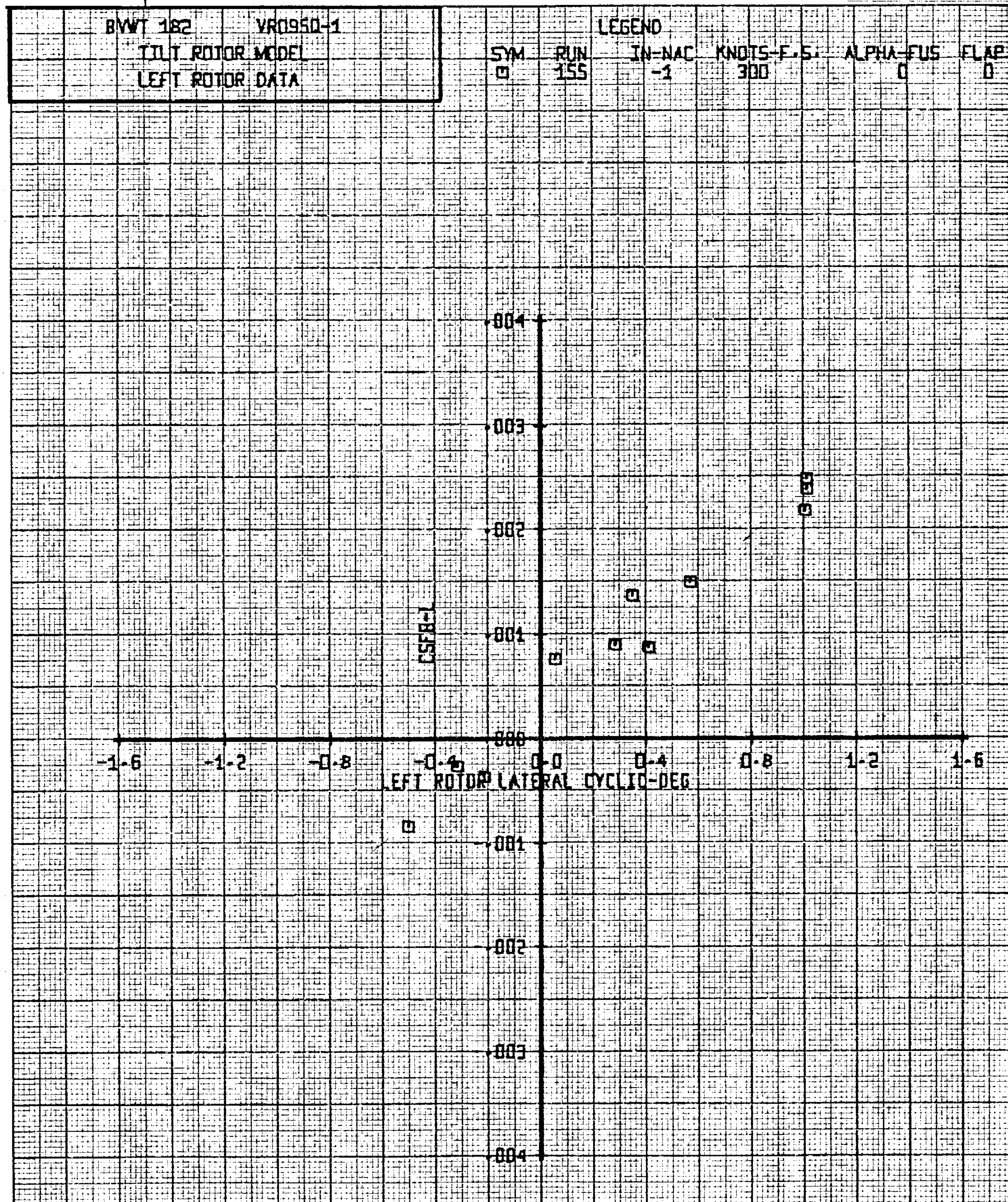


Figure 17-067. Left Rotor Side Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

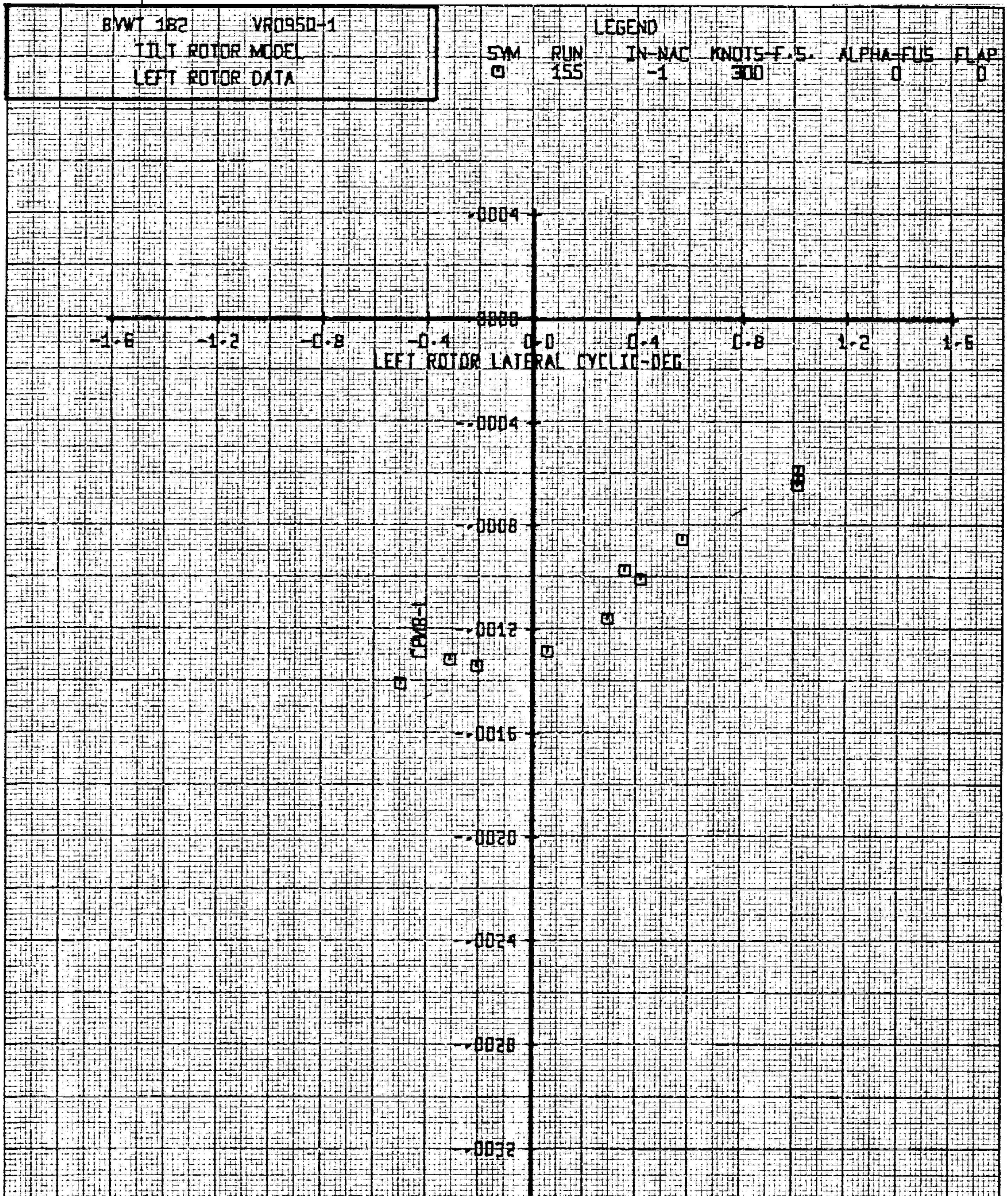


Figure 17-068. Left Rotor Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

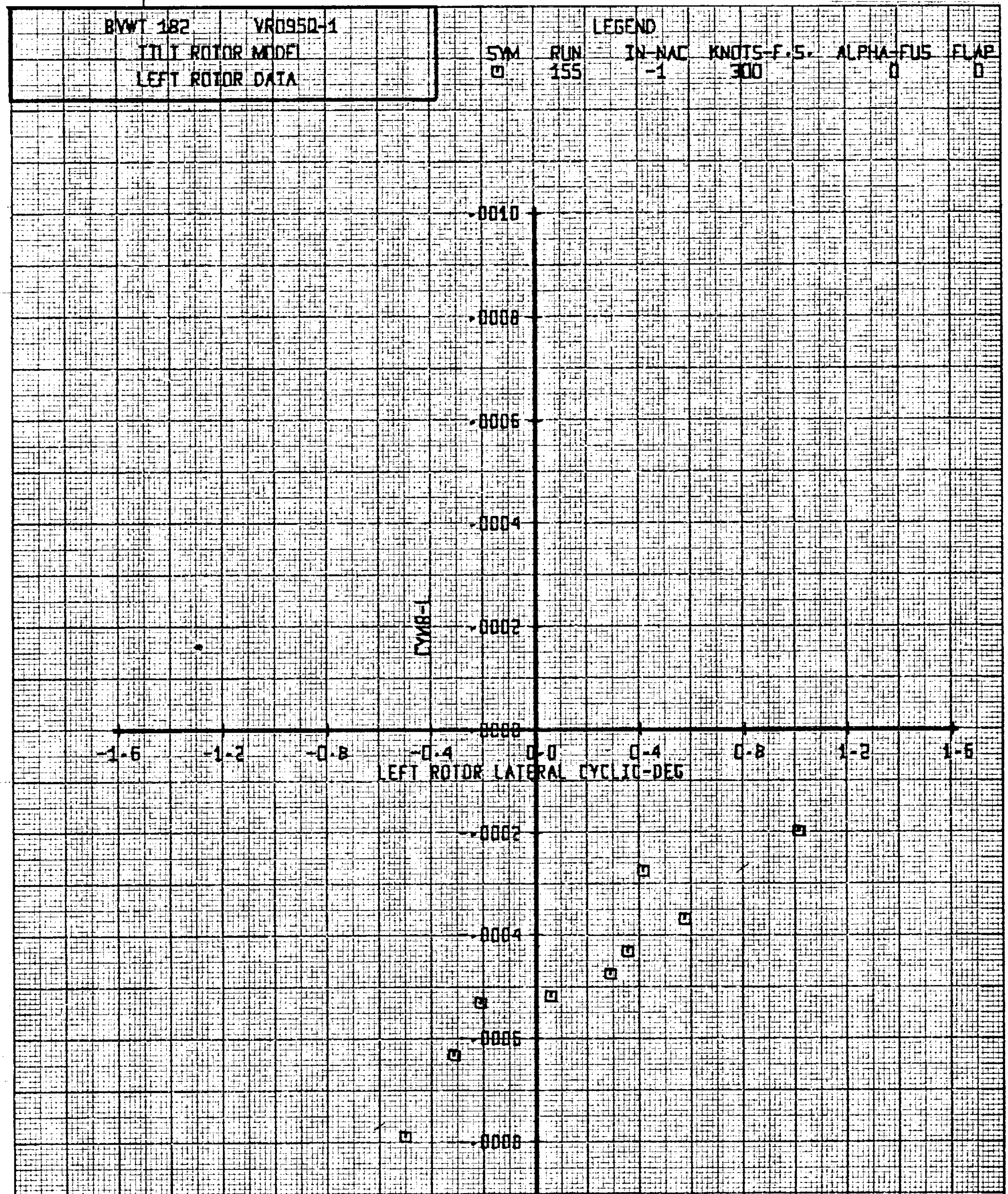
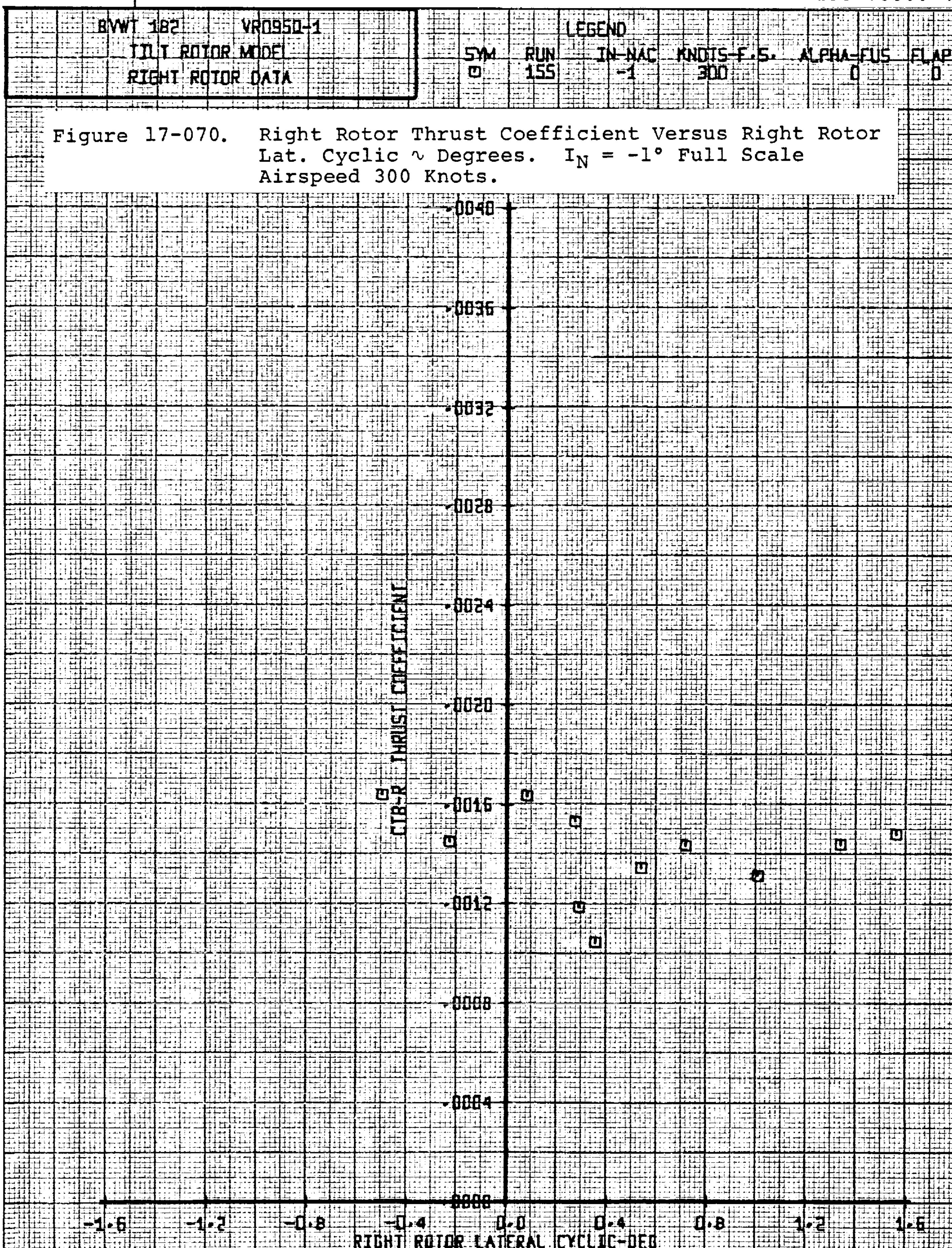


Figure 17-069. Left Rotor Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

Figure 17-070. Right Rotor Thrust Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.



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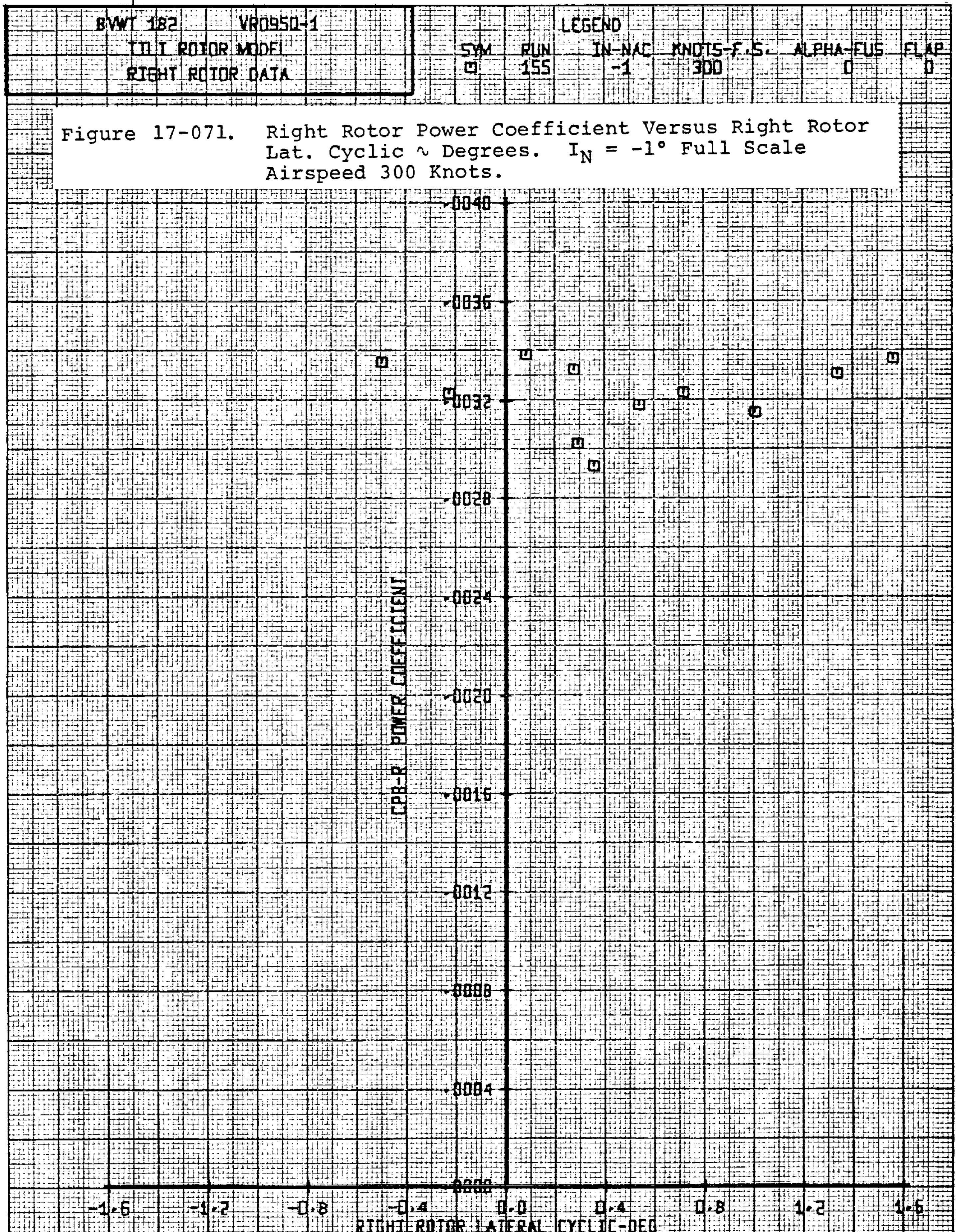
BVWT 182

Figure 17-071. Right Rotor Power Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.



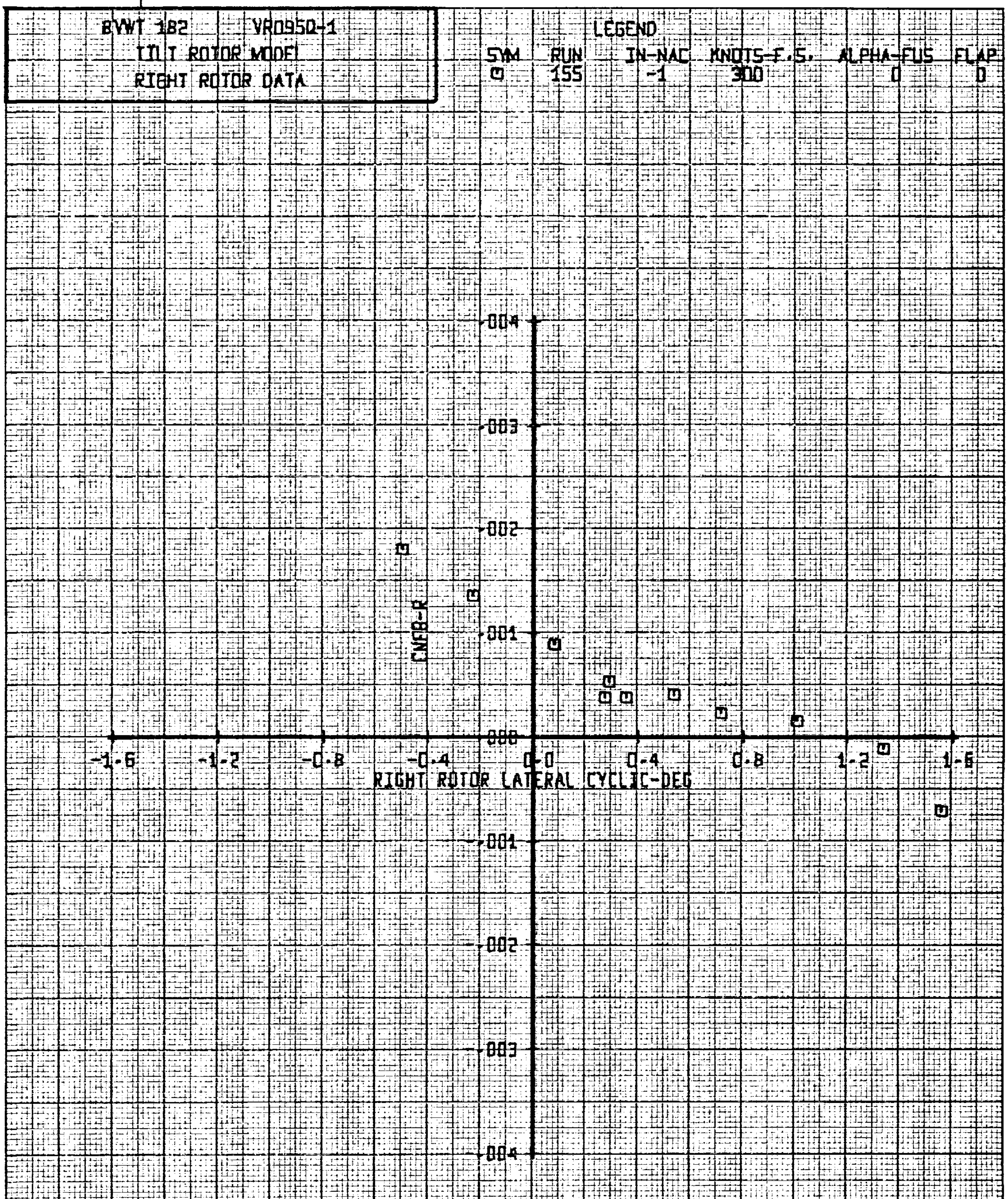


Figure 17-072. Right Rotor Normal Force Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

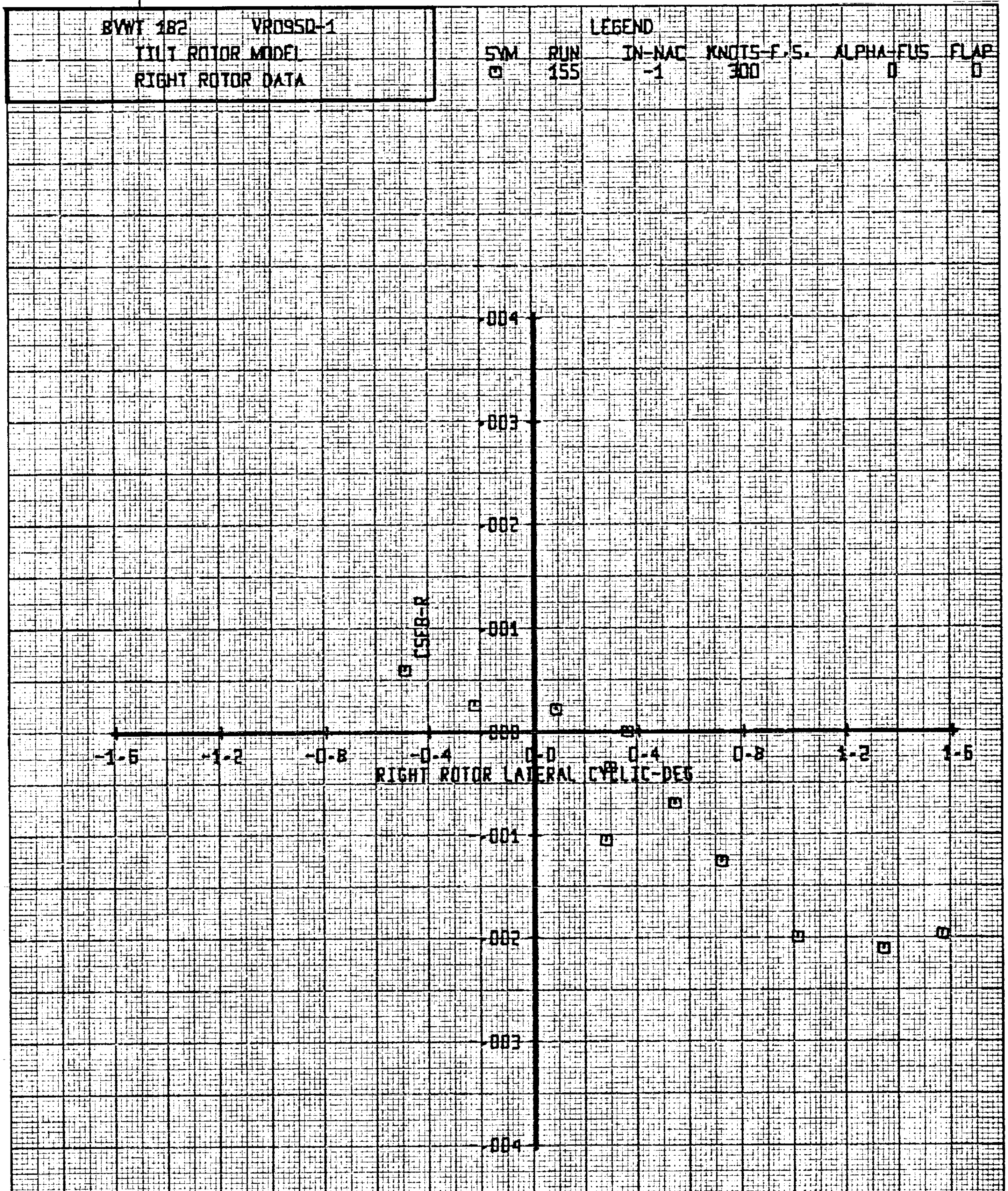


Figure 17-073. Right Rotor Side Force Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

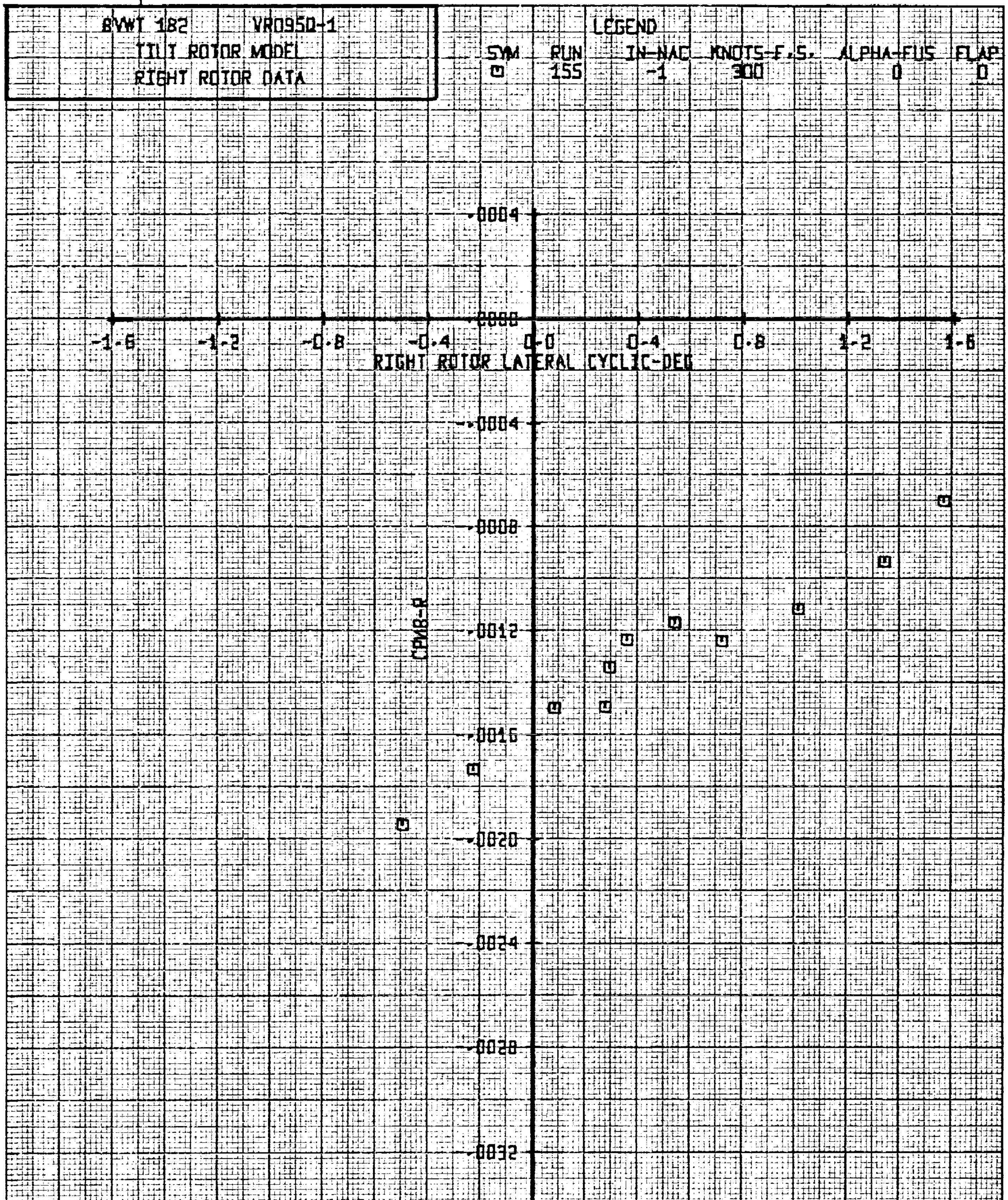


Figure 17-074. Right Rotor Pitching Moment Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

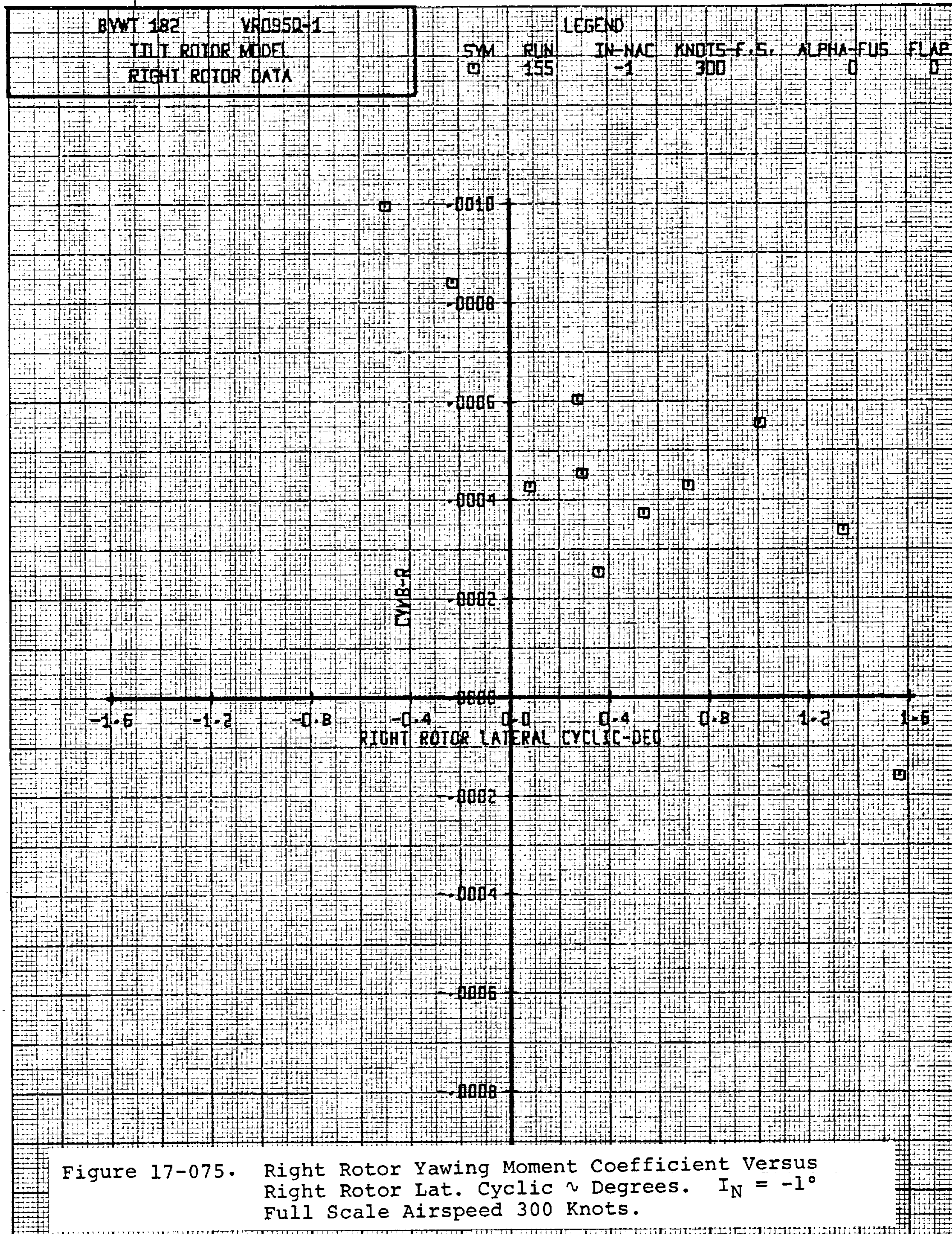


Figure 17-075. Right Rotor Yawing Moment Coefficient Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

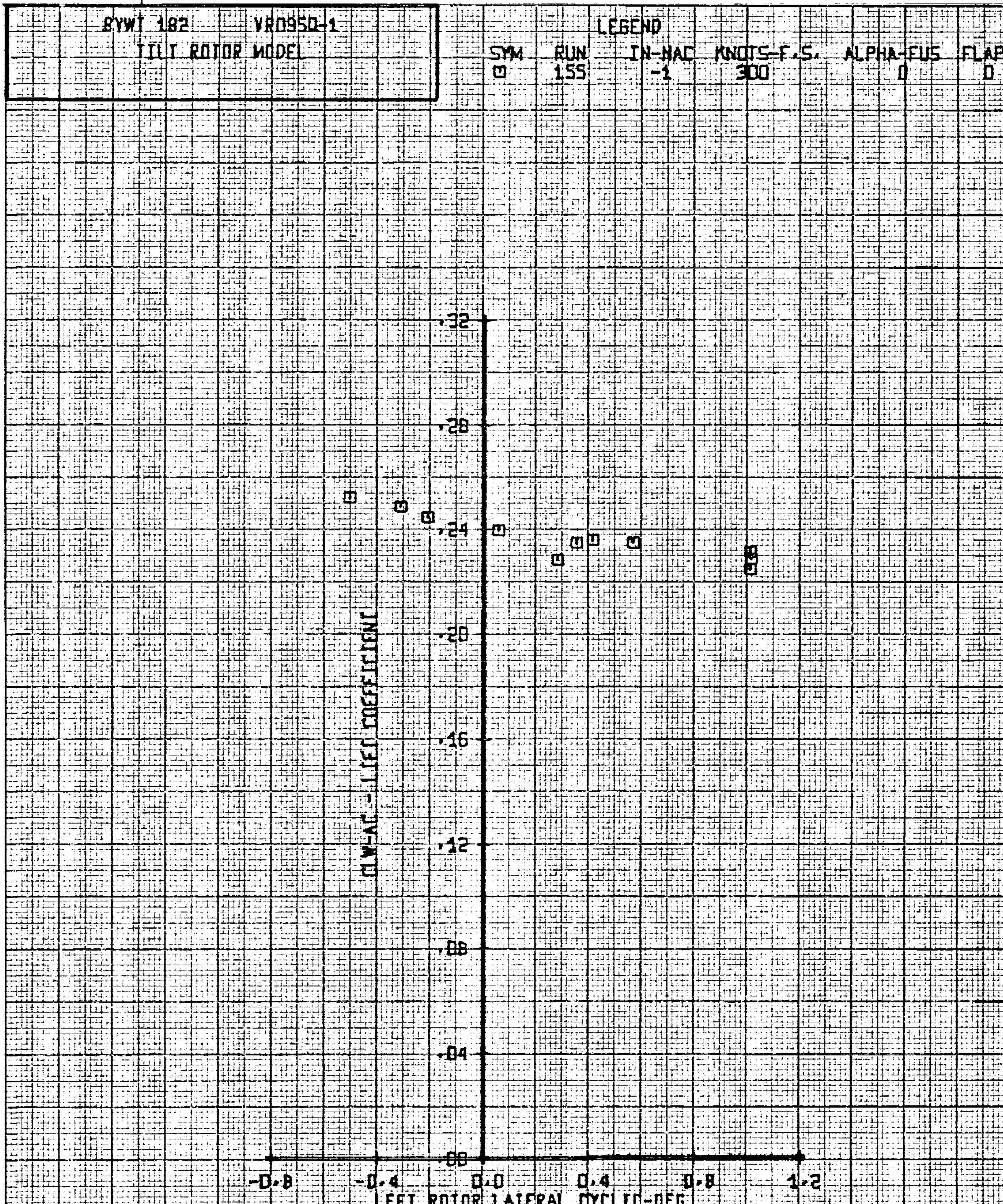


Figure 17-076. Aircraft Lift Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

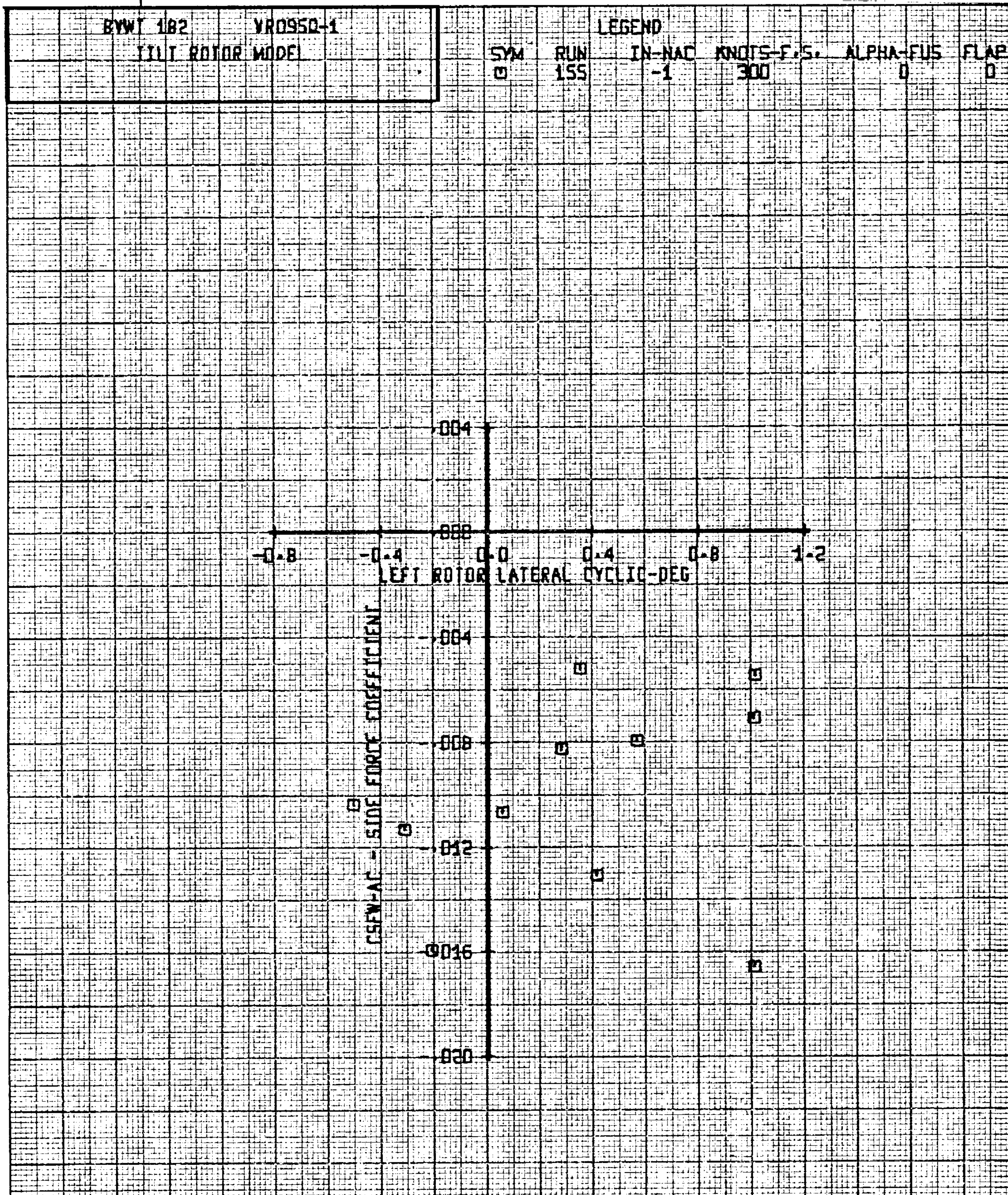


Figure 17-077. Aircraft Side Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

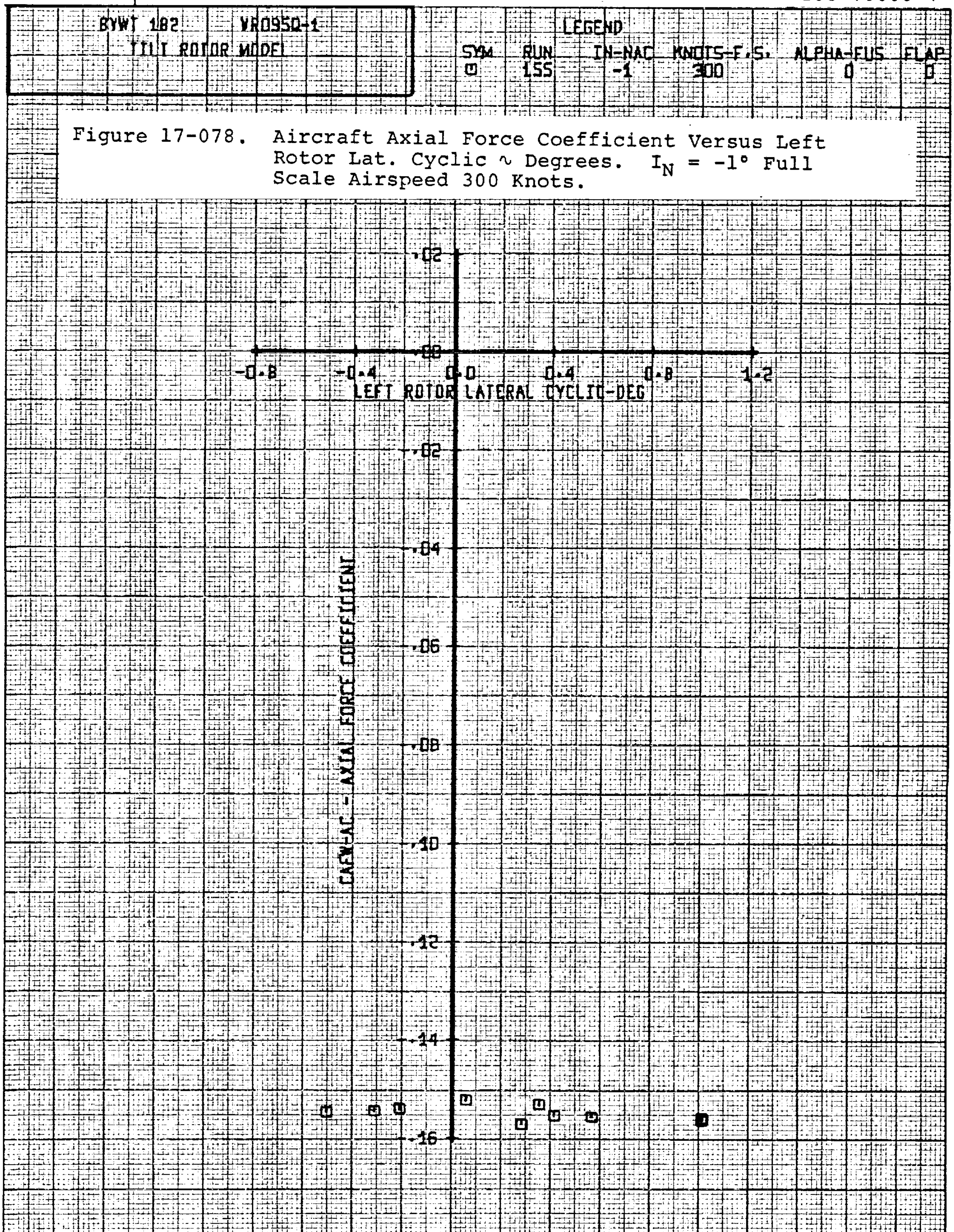


Figure 17-078. Aircraft Axial Force Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

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BVWT 182

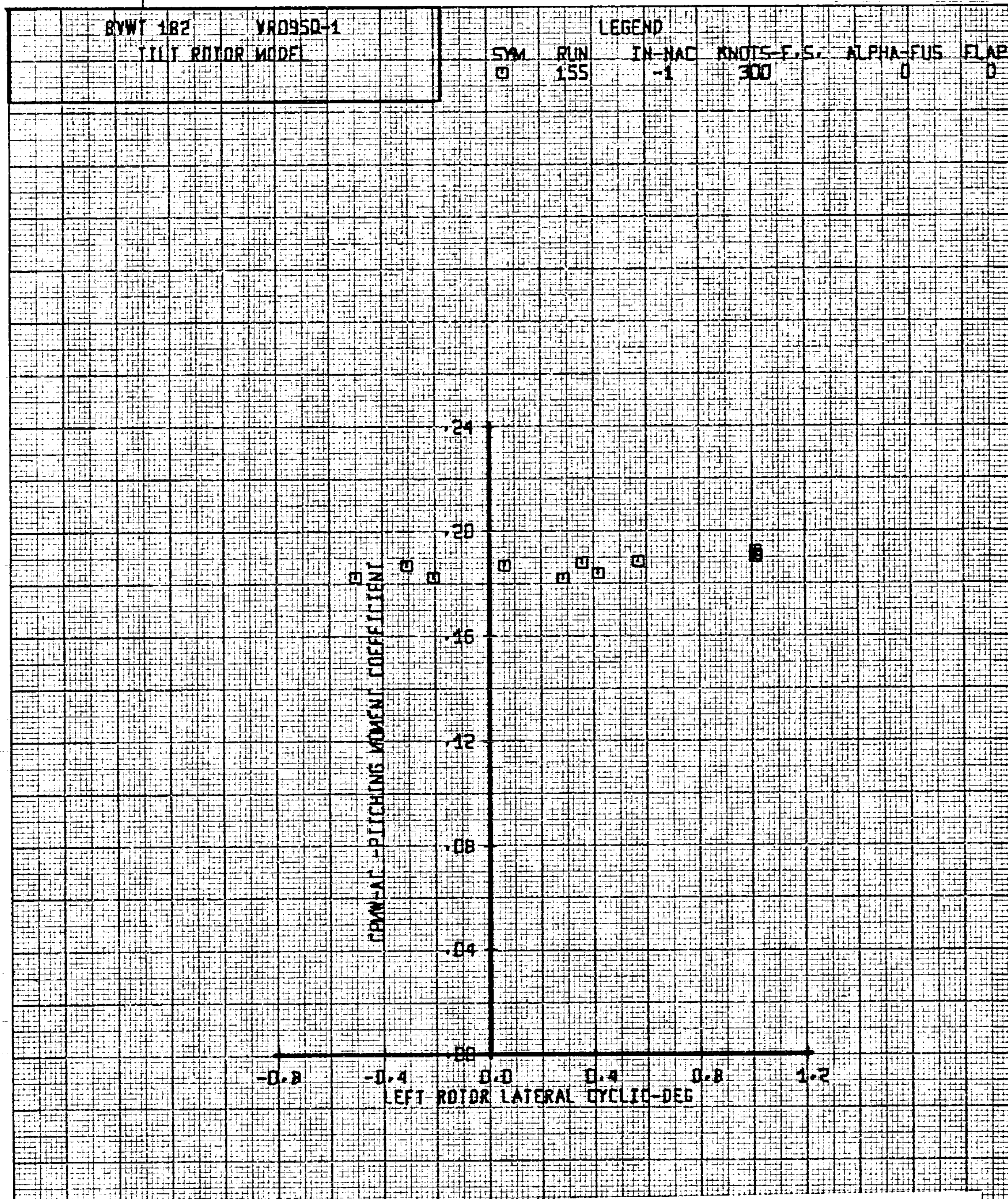


Figure 17-079. Aircraft Pitching Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

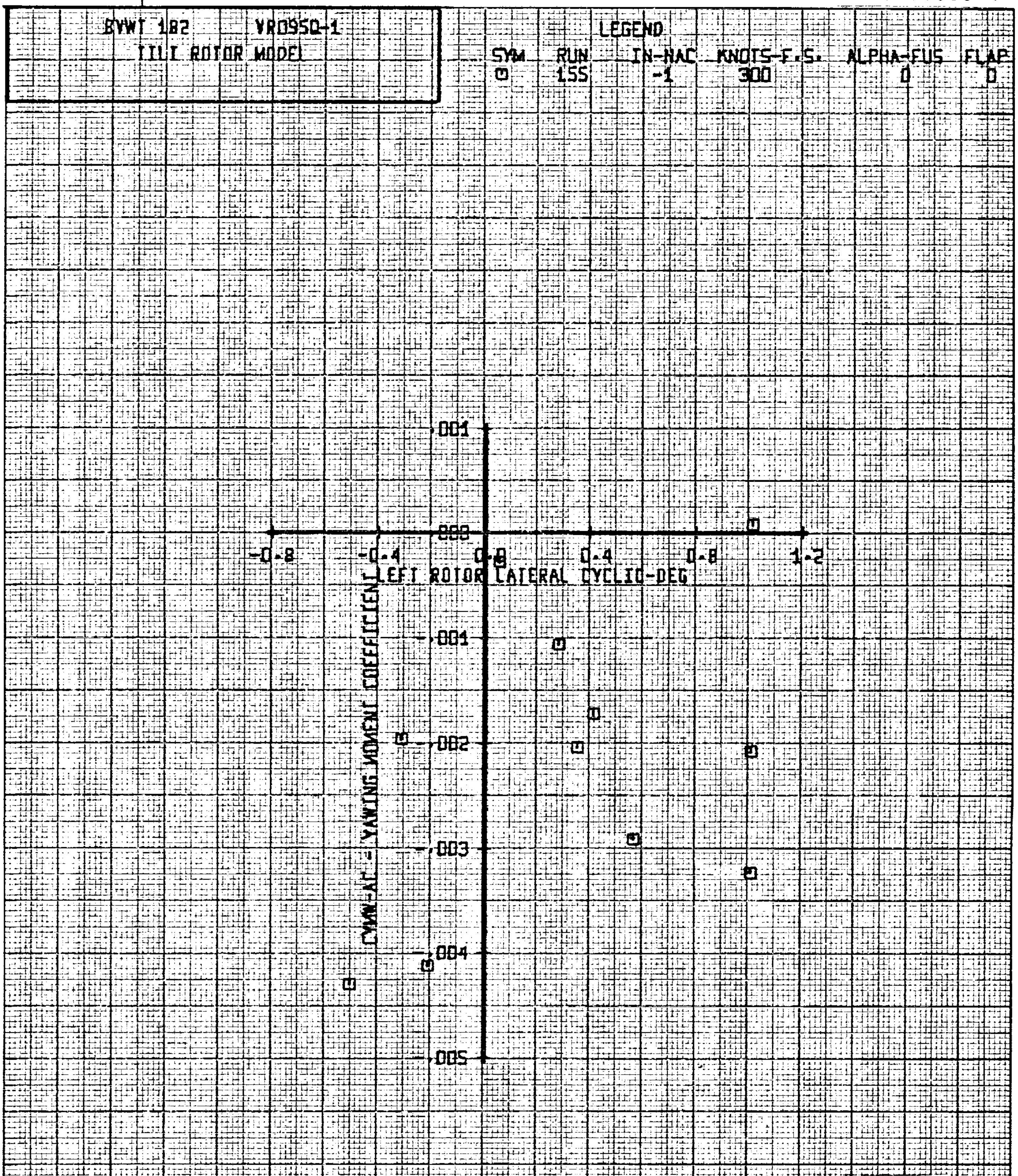


Figure 17-080. Aircraft Yawing Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 300 Knots.

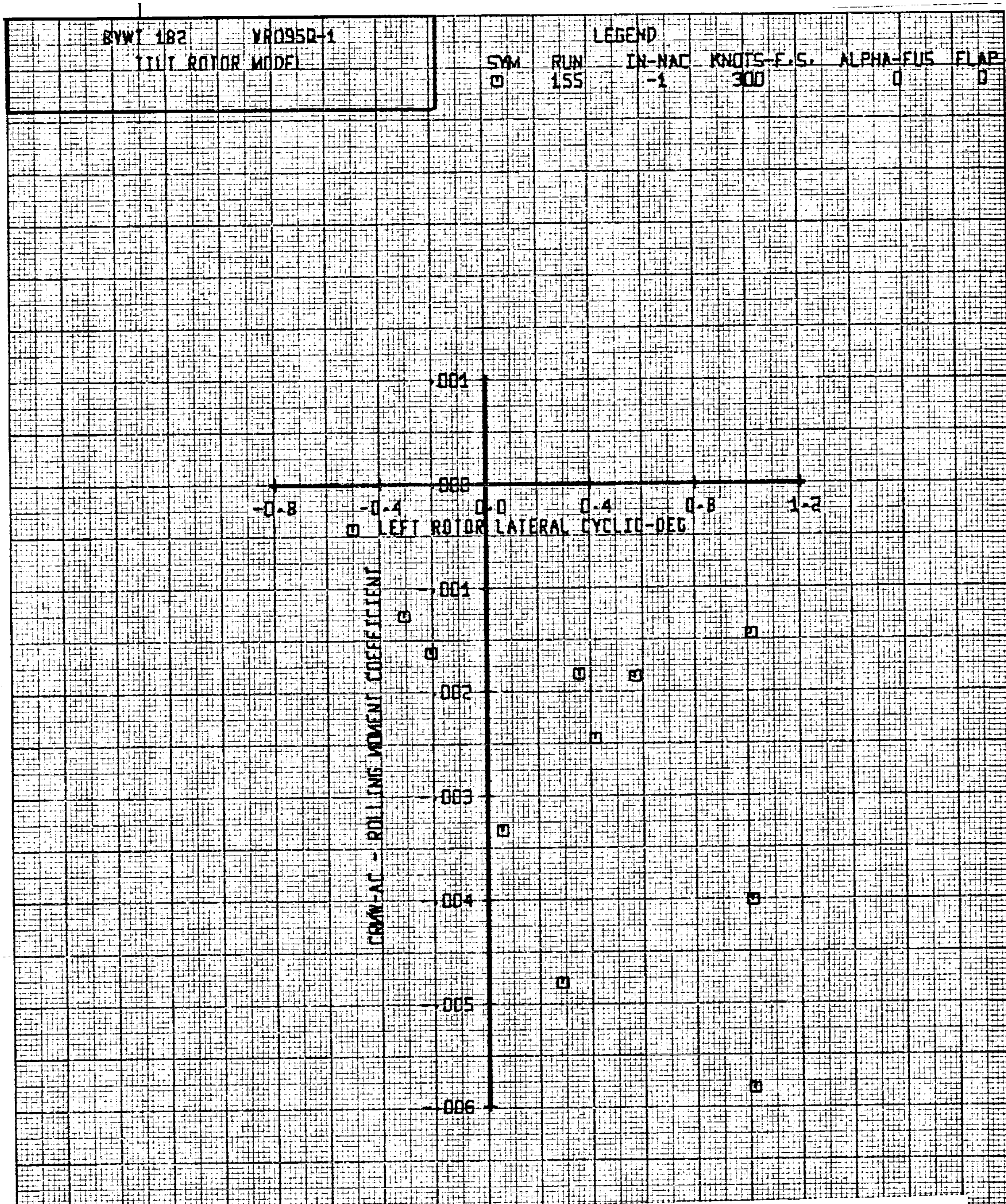


Figure 17-081. Aircraft Rolling Moment Coefficient Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

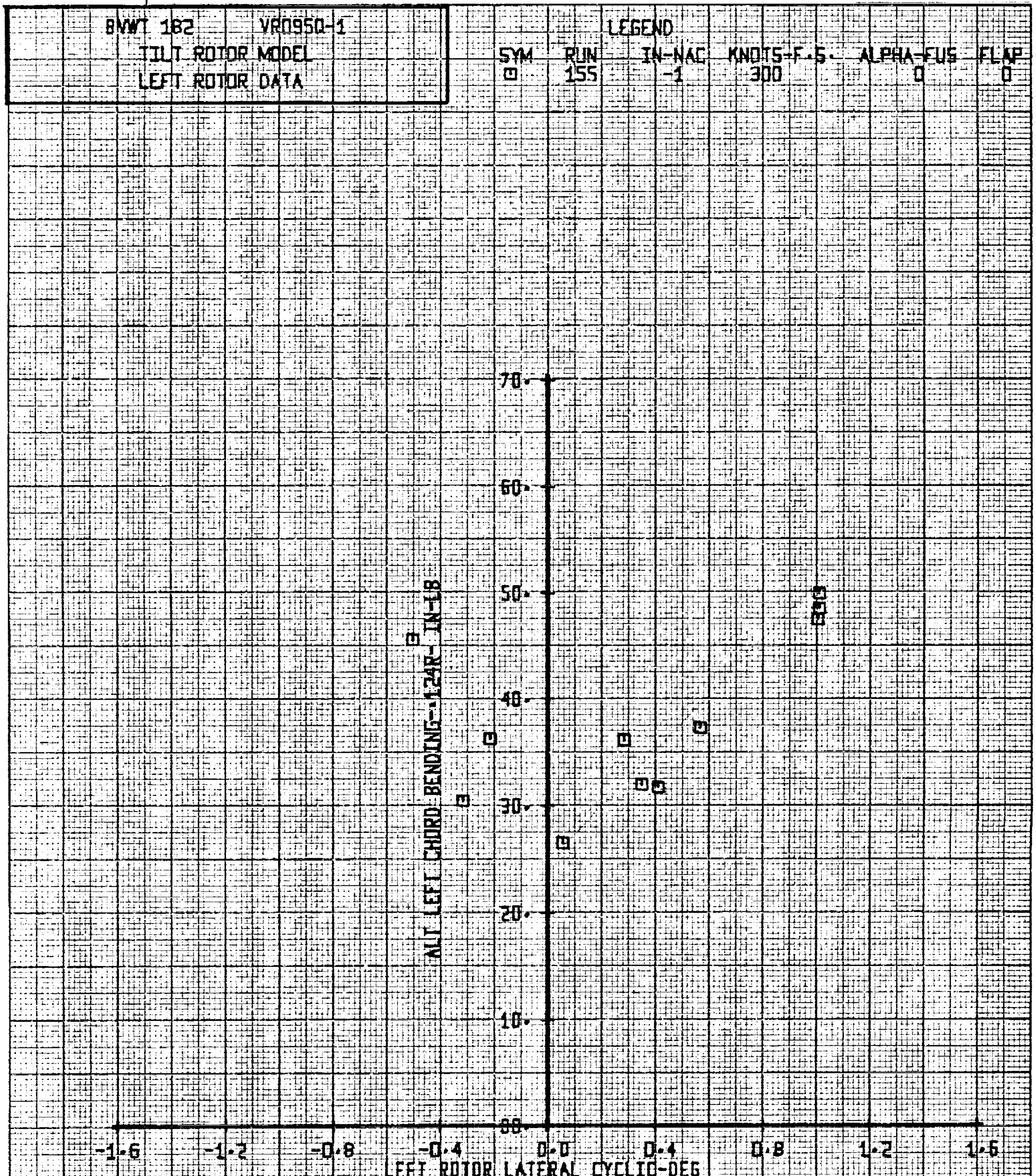


Figure 17-082. Alt. Left Chord Bending Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

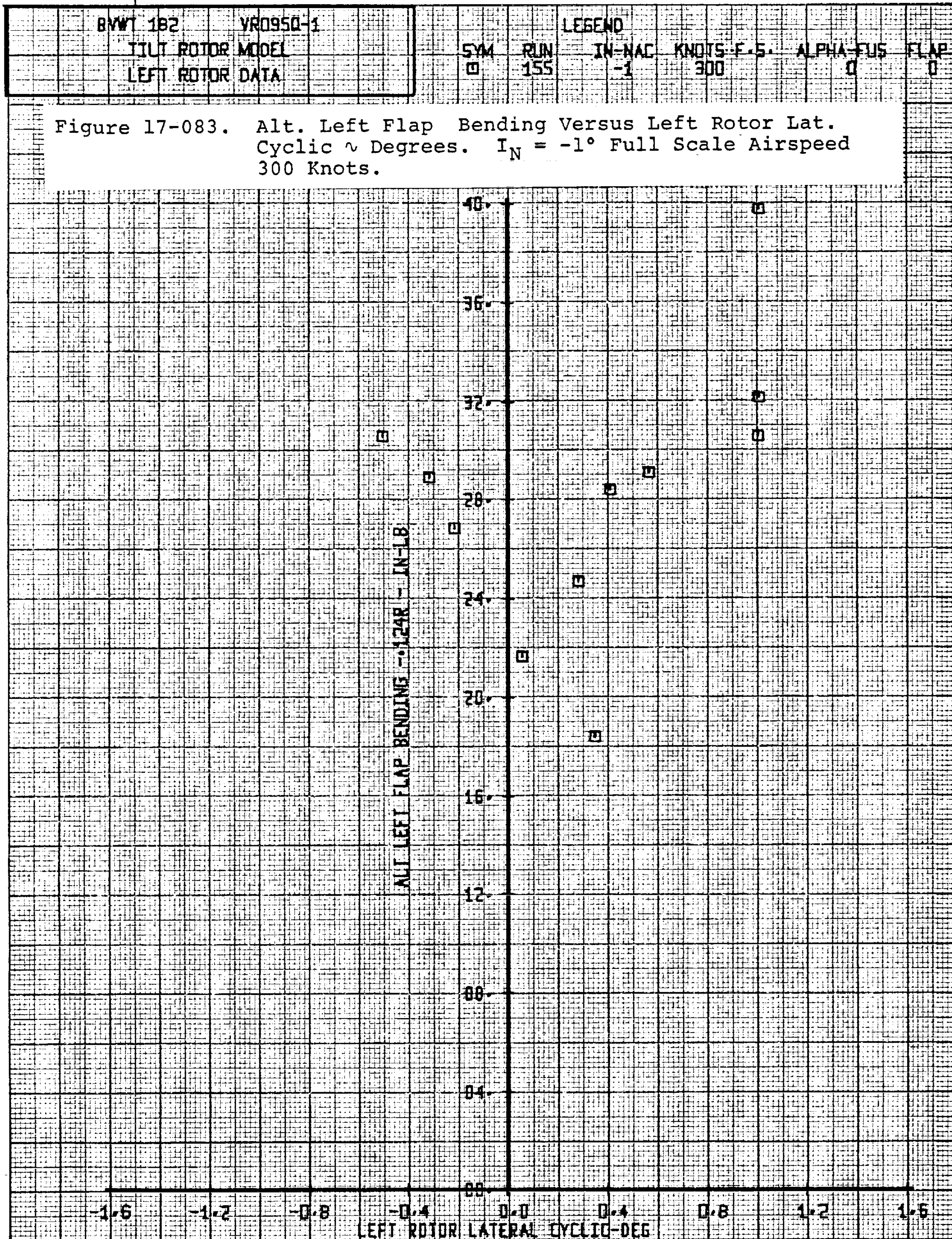


Figure 17-083. Alt. Left Flap Bending Versus Left Rotor Lat. Cyclic ∿ Degrees. I_N = -1° Full Scale Airspeed 300 Knots.

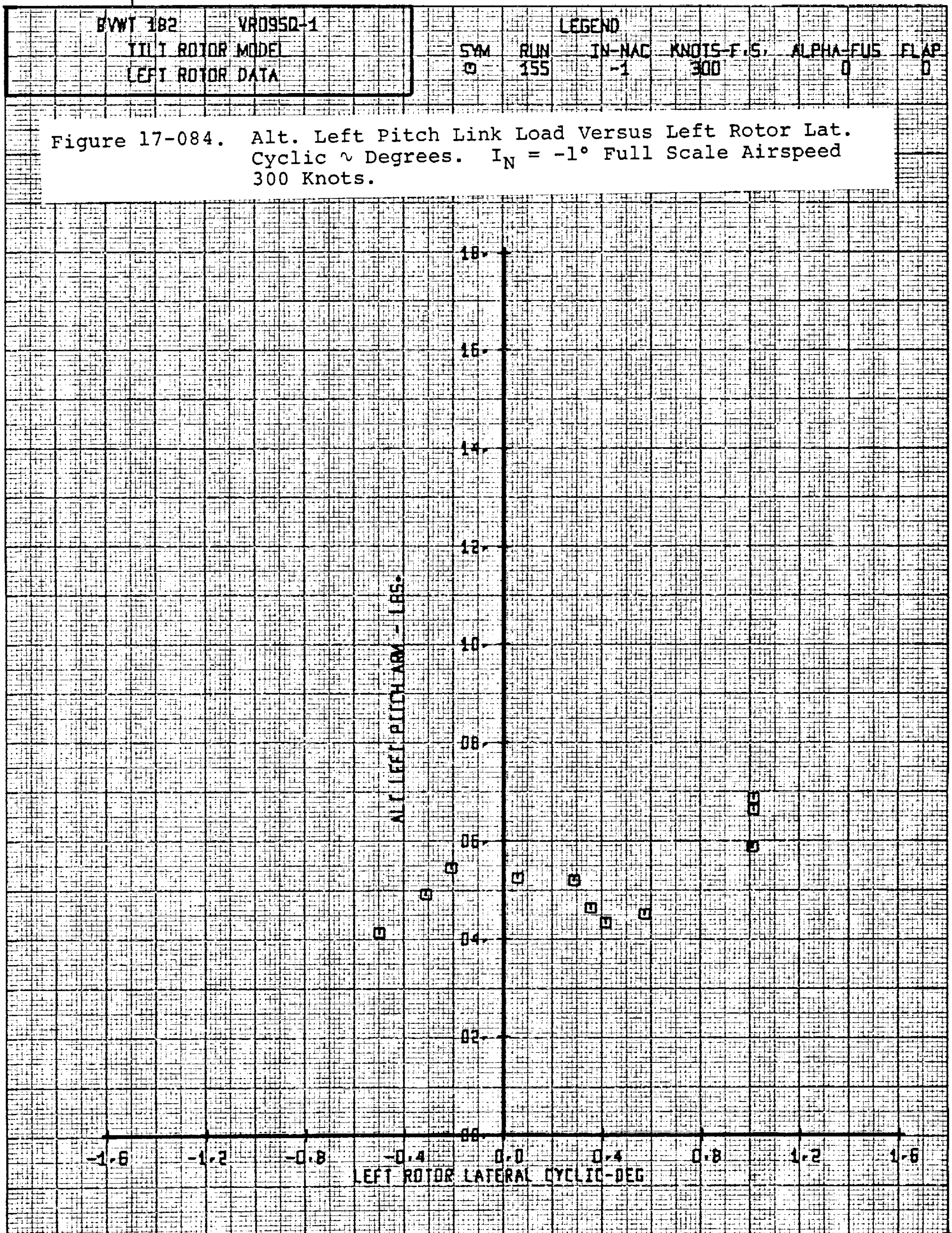


Figure 17-084. Alt. Left Pitch Link Load Versus Left Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

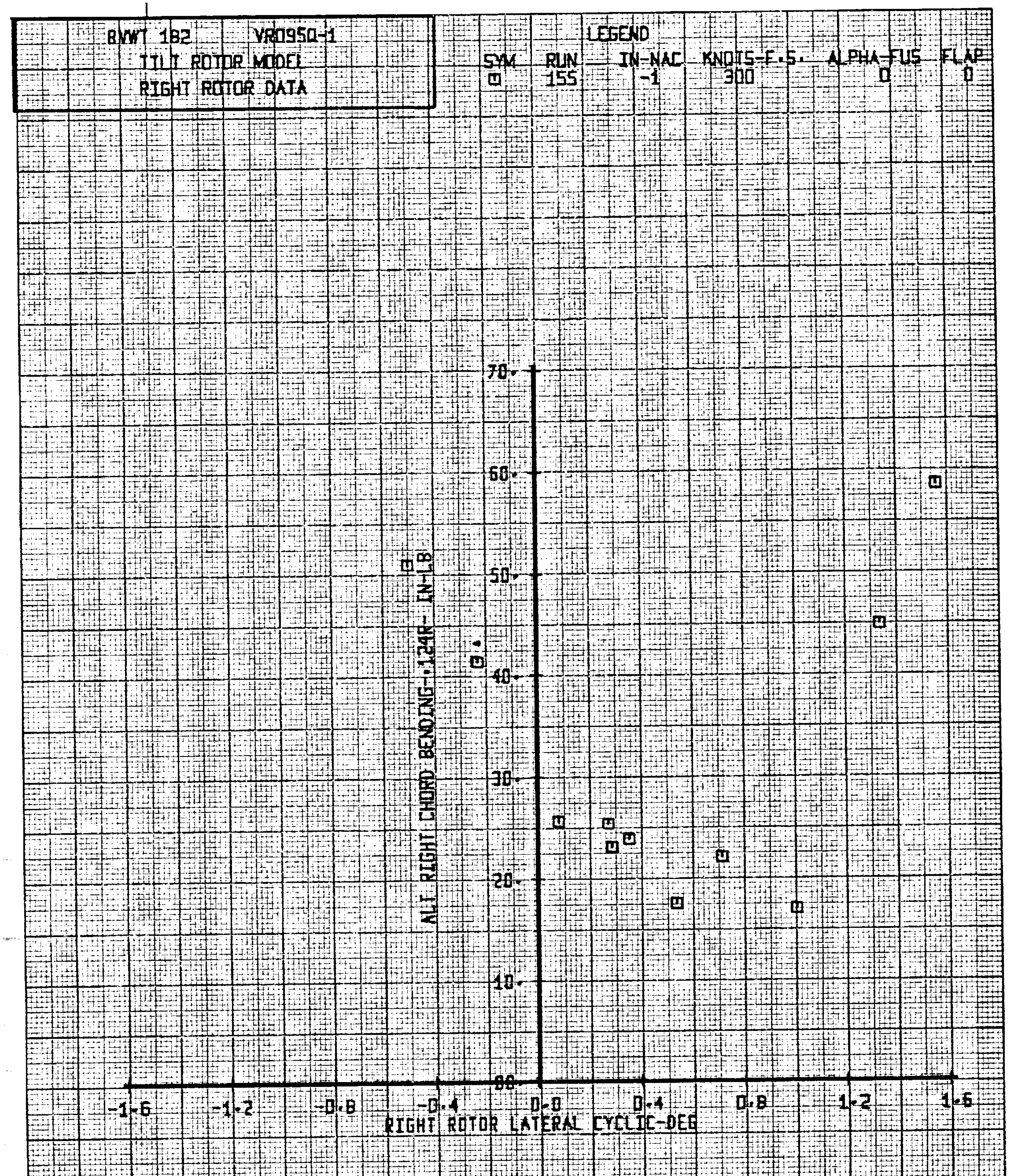


Figure 17-085. Alt. Right Chord Bending Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

Figure 17-086. Alt. Right Flap Bending Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.

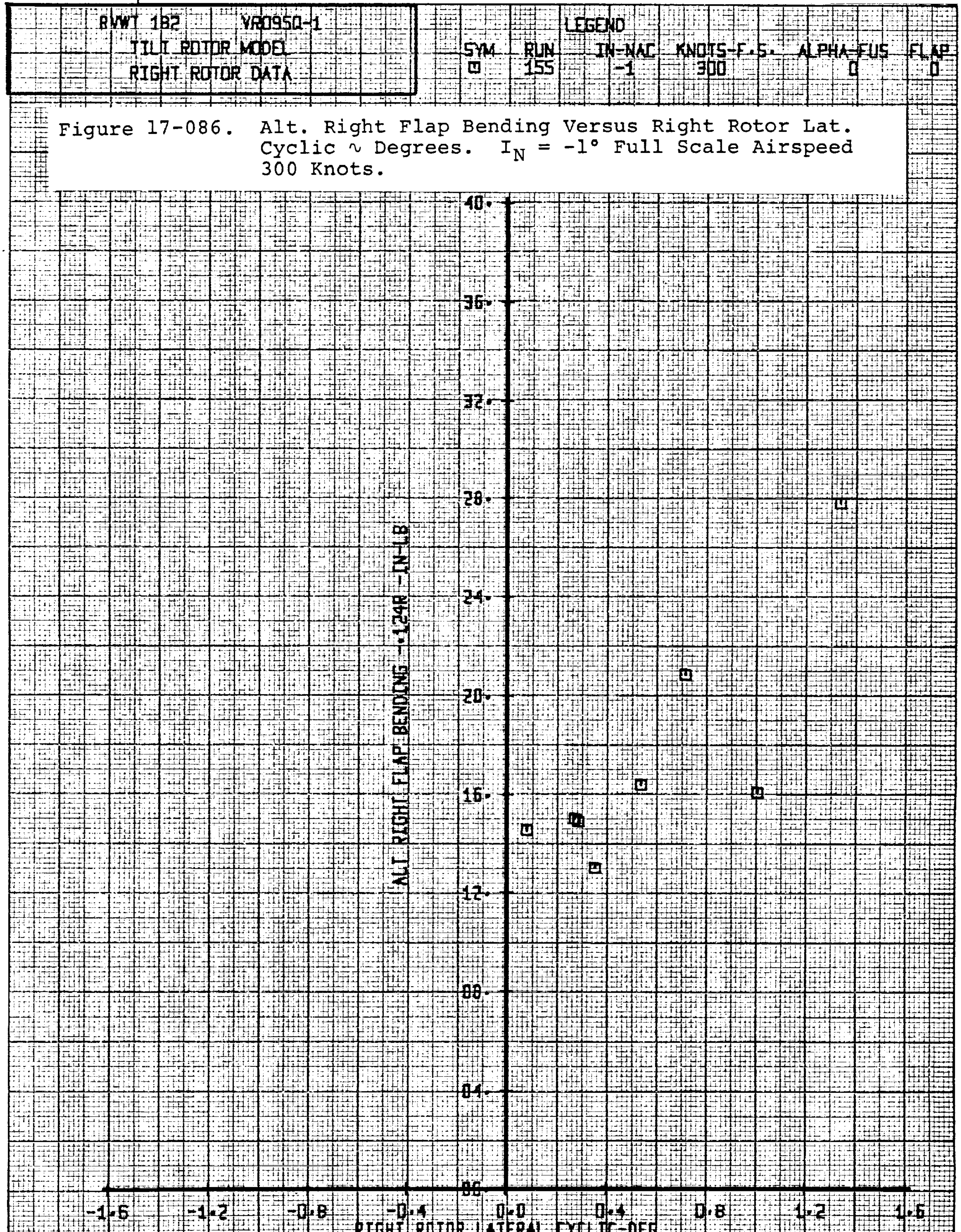
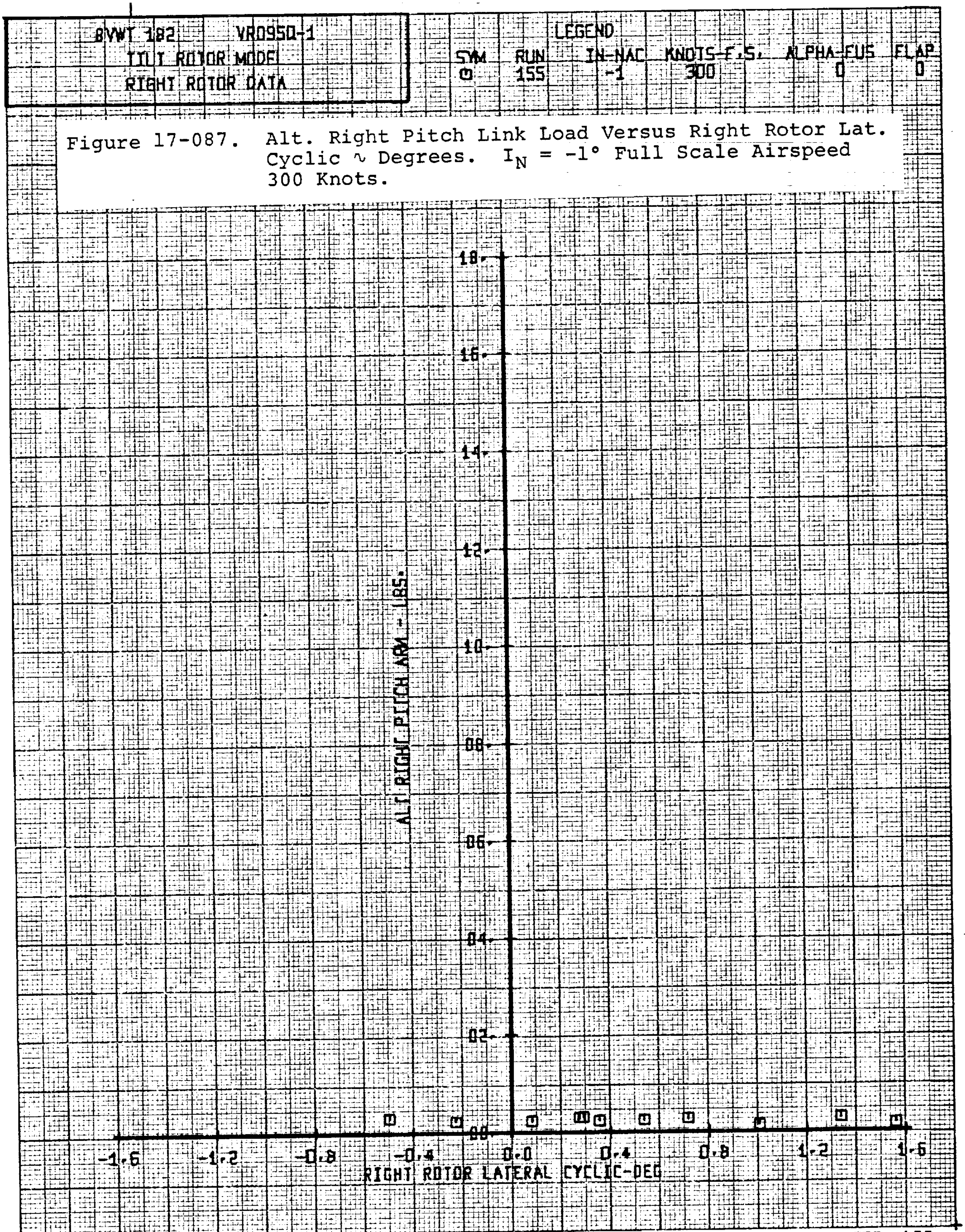


Figure 17-087. Alt. Right Pitch Link Load Versus Right Rotor Lat. Cyclic ∿ Degrees. $I_N = -1°$ Full Scale Airspeed 300 Knots.



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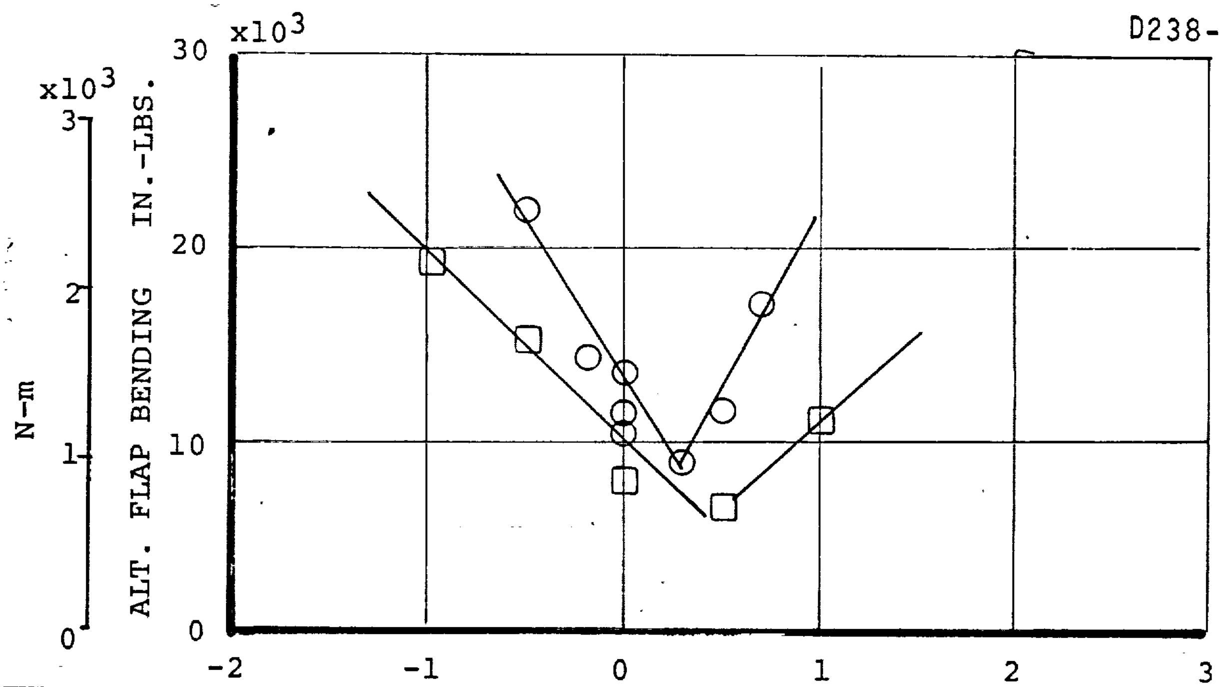


Figure 17-089. Alt. Left Rotor Blade Flap Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. I_N = -1° Full Scale Airspeed 300 Knots.

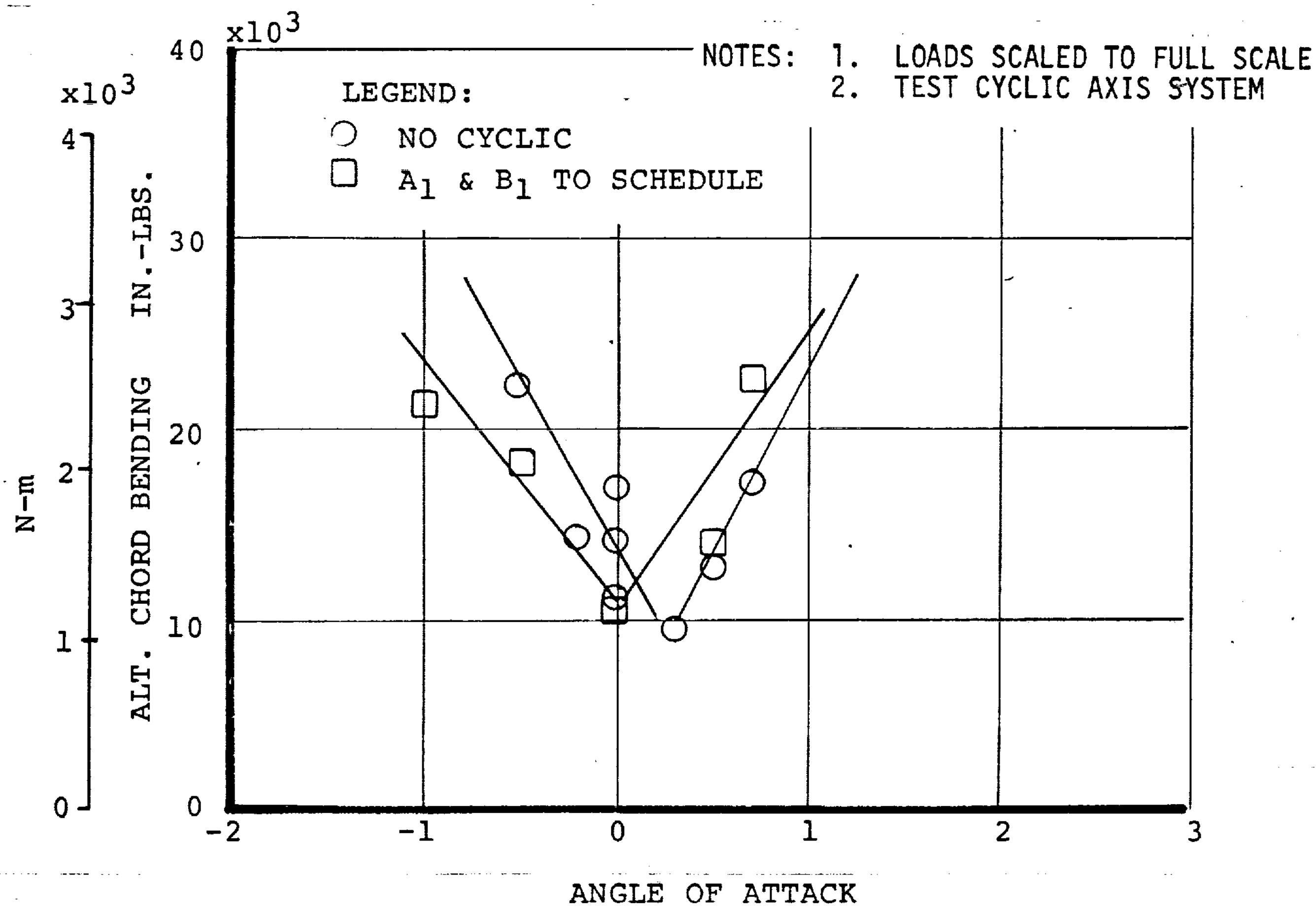


Figure 17-088. Alt. Left Rotor Blade Chord Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. I_N = -1° Full Scale Airspeed 300 Knots.

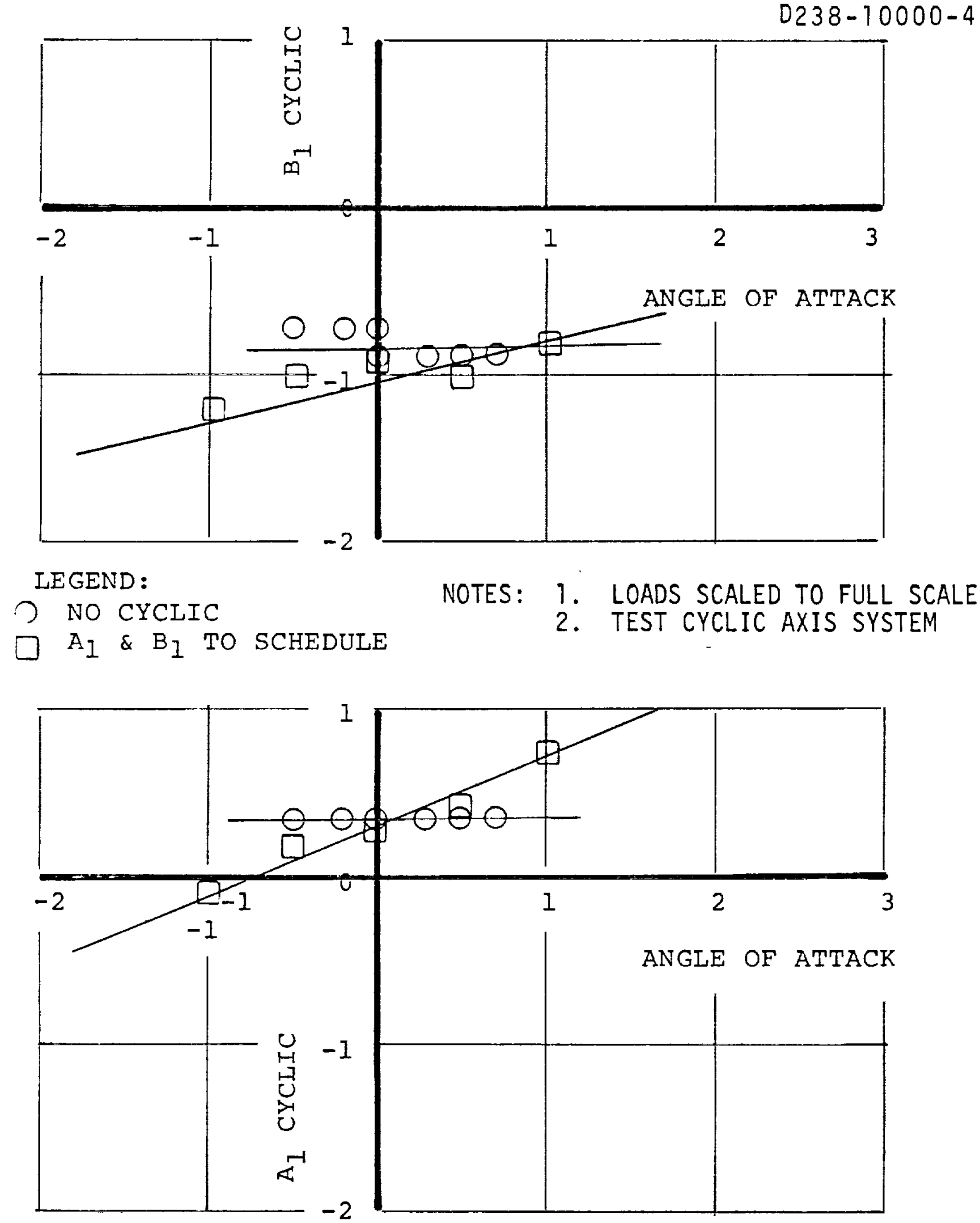


Figure 17-090. Left Rotor Cyclic Schedules. $I_N = -1°$ Full Scale Airspeed 300 Knots.

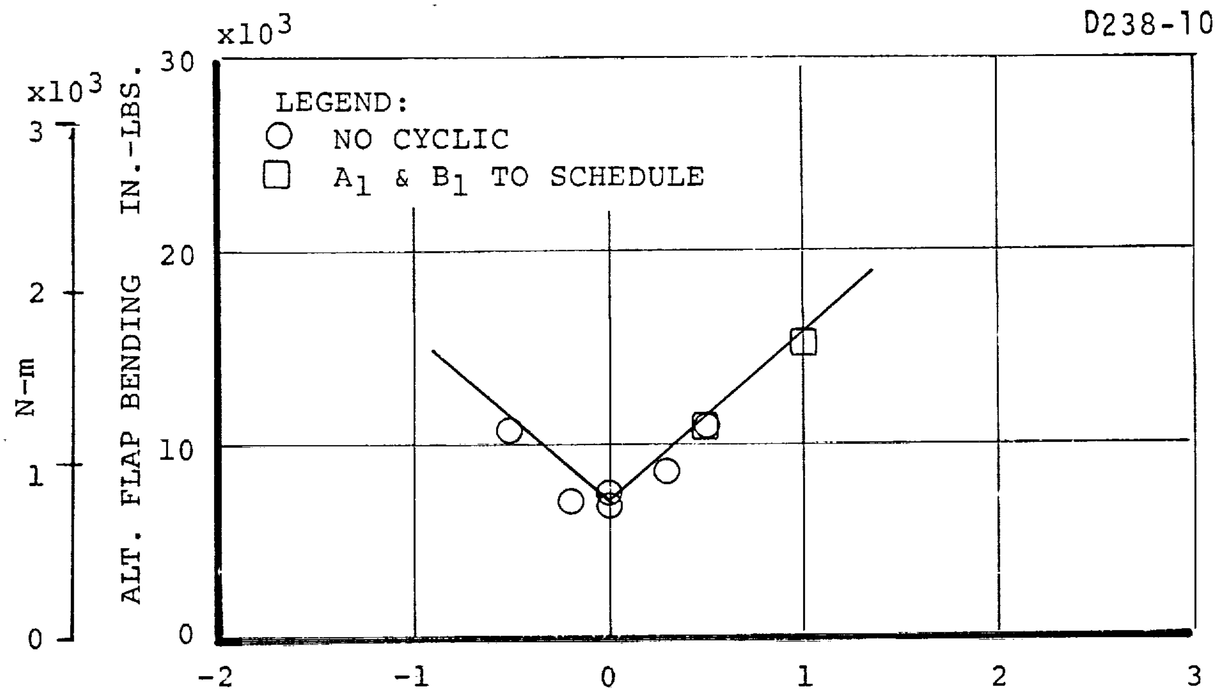


Figure 17-092. Alt. Right Rotor Blade Flap Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. I_N = -1° Full Scale Airspeed 300 Knots.

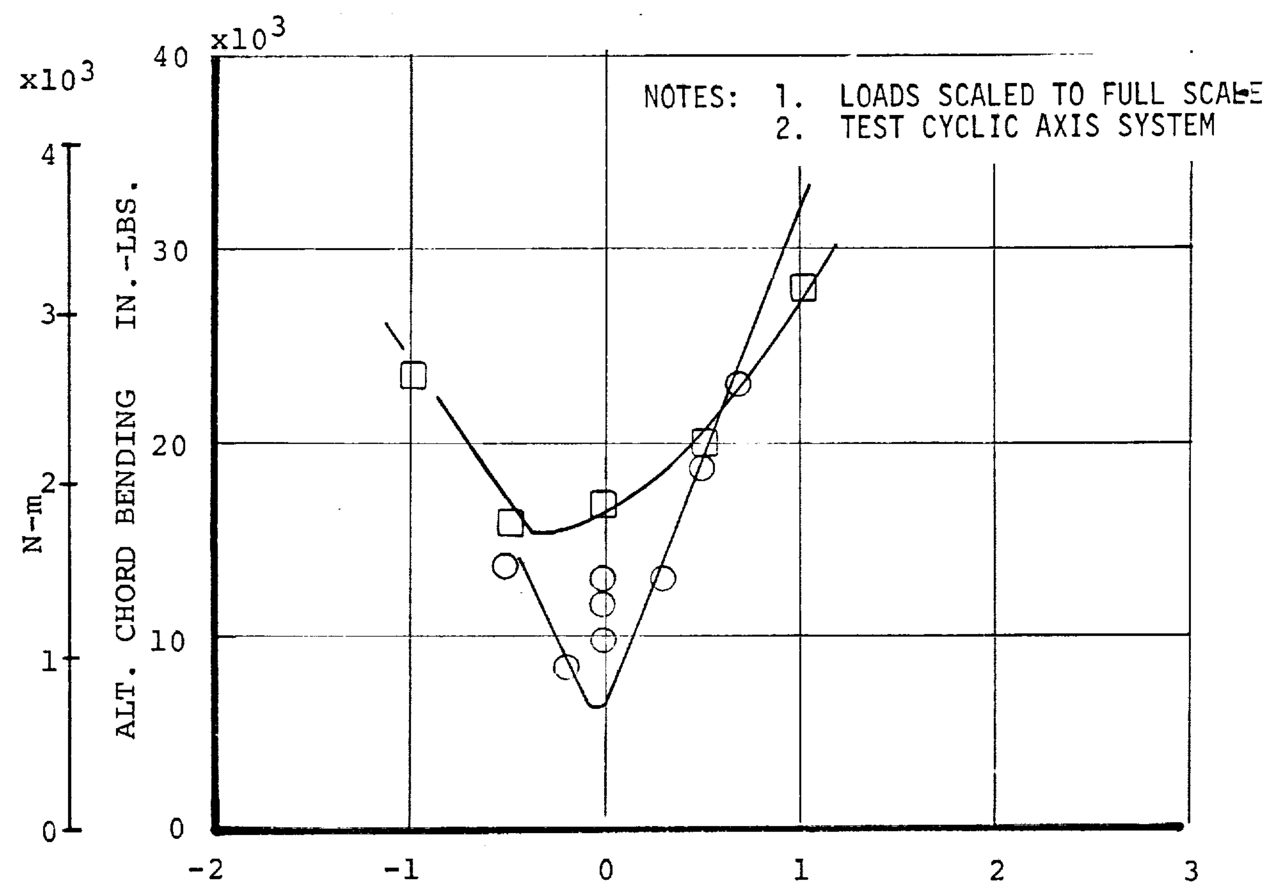
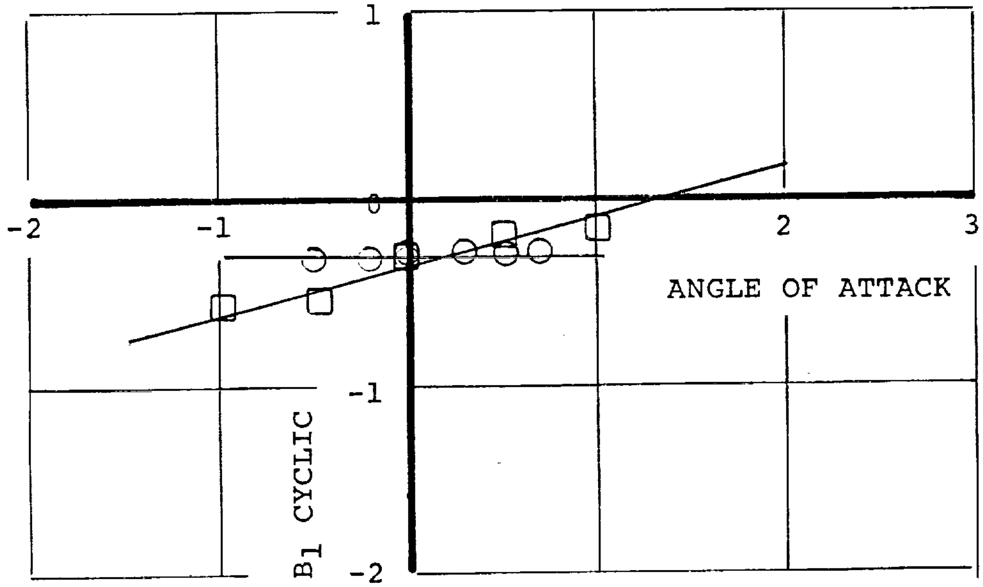


Figure 17-091. Alt. Right Rotor Blade Chord Bending Versus Angle of Attack with Zero Cyclic, Scheduled Cyclic and Minimum Loads Cyclic. I_N = -1° Full Scale Airspeed 300 Knots.



LEGEND:

○ NO CYCLIC

□ A_1 & B_1 TO SCHEDULE

NOTES: 1. LOADS SCALED TO FULL SCALE
2. TEST CYCLIC AXIS SYSTEM

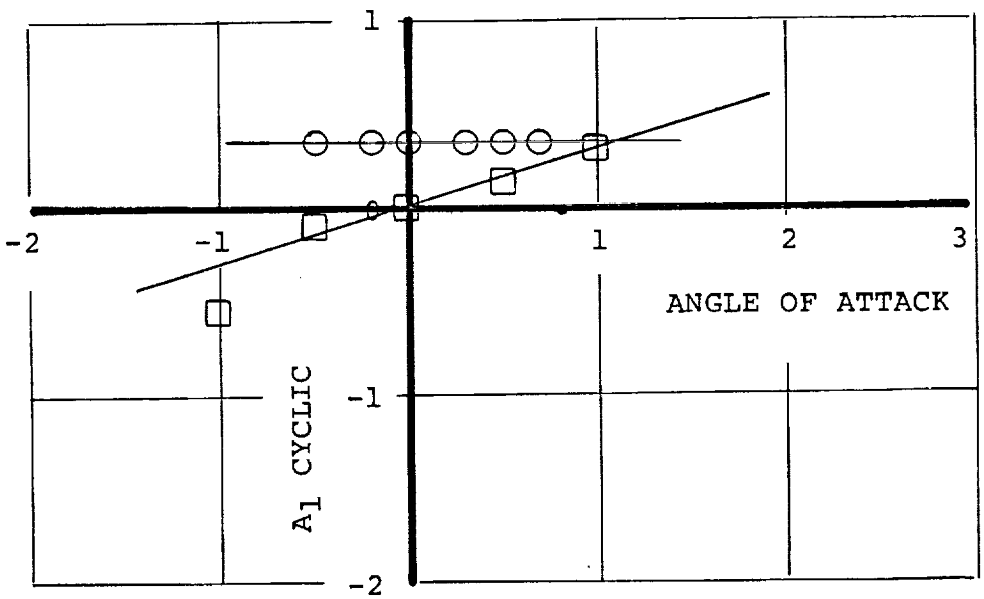


Figure 17-093. Right Rotor Cyclic Schedules. $I_N = -1°$ Full Scale Airspeed 300 Knots.